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1 5 MAY 1964

PROCEEDINGS

OF THE

Bournemouth Natural Science Society

VOL. LIII

SESSION 1962-63

Price - Five Shillings

1 5 MAY 1964

PROCEEDINGS of the

Bournemouth Natural Science Society

VOL. LIII.
SESSION 1962-3

PUBLISHED BY THE SOCIETY AT ITS HOUSE,
39 CHRISTCHURCH ROAD, BOURNEMOUTH, 1964

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Introductory Note

The objects of the Society are declared in the second of its Rules to be "the promotion of the study of Science in all its branches, and of Public Education, by means of Lectures, Field Meetings, the reading and discussion of Papers, and in any way that the Council of the Society shall deem advisable."

The branches of Science at present represented are as follows:—**Archaeology and History, Astronomy, Botany, Entomology, Geography, Geology, Microscopy, Photography, Physics and Chemistry, and Zoology.**

During the **Winter Session,** from October to April, frequent meetings are held, comprising Lectures on subjects of scientific interest, illustrated by lantern slides, films, epidiascope, diagrams, specimens, and experiments.

Throughout the **Summer Session,** Field Meetings on an average of two or three a week, are held in suitable places in the neighbourhood of the town, or Coach and Train Tours are arranged to districts of scientific interest at a distance.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting.

The Society possesses a Library available for the use of members. Books may be borrowed by members, and there is a Reading Room in which works of reference may be consulted. The Museum contains many valuable scientific collections and specimens. The Library and the Museum serve to illustrate and illuminate the ten Sections of the Society. There is a well-equipped Dark Room for the use of members interested in Photography. The house stands in a pleasant garden of over an acre.

Members are elected by the Council, and pay an annual subscription of £1 10s. 0d. for full membership, or £15 for Life Membership. An Entrance Fee of 5/- is payable upon nomination for election. The Family Subscription (for members of a family living in the same house) is as follows:—First Adult Member, £1 10s. 0d.; Second Adult Member, £1; each additional Adult Member, 10/-; Children between 12 and 18 years, 10/- (Associate Members). Members living six miles or more from 39 Christchurch Road pay half the above rates. Renewable monthly membership, 5/-, is available.

A bi-monthly Programme, giving full details of all meetings, is posted to every member, and a Volume of Proceedings is published annually, of which adult members receive a copy.

Application Forms for Membership and further particulars may be obtained from the Honorary Assistant Secretary,

G. A. SLATER,
6 Wyndham Road,
Parkstone, Poole.

Bournemouth Natural Science Society

OFFICERS AND COUNCIL FOR 1963-64

N.B.—University and other qualifications are only attached at first mention of names.

President
MISS F. M. EXTON, B.A.

Chairman of Council
H. V. HARRIS

Deputy Chairman of Council
MISS D. M. LOWTHER, B.SC.

Council
THE OFFICERS AND CHAIRMEN OF SECTIONS *(ex-officio)*

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W. S. I. COX, F.R.E.S.
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A. A. FOYLE
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J. C. MITTON, A.C.A.
W. MOORE
W. E. PAGE, M.A.
MISS M. A. M. PENROSE, B.SC.
P. J. PIPER, F.R.I.C.S.
W. J. READ, M.SC., F.R.I.C.
MRS. N. SEPHTON, M.B., Ch.B.
G. A. SHILLIDY, C.I.E.
MRS. B. TAYLOR
MRS. W. BOYD WATT, F.Z.S., M.B.O.U.
MISS E. M. WHITAKER
MRS. M. P. YULE

Chairmen of Sections

Archaeology and History: MRS. C. SIMPSON
Astronomy: W. P. WINTER, B.SC.
Botany: MRS. A. K. HUNT, B.SC.
Entomology:
Geography: MISS F. M. EXTON, B.A.
Geology: D. A. WRAY, Ph.D., M.SC., F.G.S.
Microscopy: A. J. AIERS, M.I.Mech.E., M.I.P.E.
Photograpy: MISS U. M. OGLE
Physics and Chemistry: H. E. CLARKE, M.A., B.SC., F.R.I.C.
Zoology: H. V. HARRIS

Hon. Treasurer
F. J. WOOD

Hon. Assistant Treasurer
A. E. WITHERS

Secretaries
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Hon. Assistant Secretary: G. A. SLATER
Hon. Programme Secretary: A. CHARTER

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Hon. Curator
W. L. WHITTLE, M.I.M.E., F.R.A.S., F.G.S.

Hon. Editor
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Hon. Auditors
A. V. LAWES AND A. H. MIDDLEMAST

Hon. Architect
A. J. BUTCHER, F.R.I.B.A.

Hon. Solicitor
G. A. TURNER

Bankers
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Chairman: H. V. HARRIS
Hon. Treasurer: F. J. WOOD *Hon. Secretary:* T. H. BICKEL
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Library:

Chairman: J. H. BAILEY
D. T. ADAMS, H. E. CLARKE, M. H. COCKE, A. A. FOYLE, H. S. HOLBROOK

Museum:

Chairman: W. L. WHITTLE
CHAIRMEN OF SECTIONS *(ex-officio)*

Tea:

Chairman: MISS E. M. WHITAKER
Deputy Chairman: MRS. A. A. BAILEY
MRS. H. V. HARRIS, MRS. LE SUEUR, MRS. LOGIE, MRS. MIDDLEMAST, MRS. POWIS, MISS ROWE, MISS SAUNDERS, MRS. SLATER, MRS. TAYLOR, MISS TYLER, MRS. VINCENT, MISS WHITE, MRS. WITHERS, MRS. WYCHERLEY

Garden:

Chairman: MRS. W. CHOME
E. CHAMBERS, MRS. A. K. HUNT, MISS E. M. WHITAKER, W. L. WHITTLE

Entertainment:

Chairman: MRS. I. M. SIMMONS
J. H. BAILEY, MISS C. M. BRAIN, MISS G. GREEN, G. HOLROYD, MRS. R. B. SUNDERLAND, MISS F. H. WARDEN, W. P. WINTER

House:

Chairman: G. A. SHILLIDY
W. E. PAGE, P. J. PIPER, MRS. N. SEPHTON, MRS. D. E. WITHERS

Projection:

Still: G. HOLROYD (*Leader*), J. C. MITTON, W. MOORE
Ciné: D. J. DUDLEY *(Leader)*, MRS. I. SEWELL

Bournemouth Natural Science Society

List of Members

Revised to 6th January, 1964

*HONORARY MEMBER — wGILBERT WHITE FELLOWSHIP
vVICE-PRESIDENT — lLIFE MEMBER
†PAST PRESIDENT — oORIGINAL MEMBER
aASSOCIATE MEMBER

The year of election is given before the name of each member

1952	Adam, Miss A. Irvine	17 Linwood Road
1961	Adams, D. T., M.A.	13 Sandy Mead Road, Queen's Park
1961	Adams, Mrs. M.	" "
1963	Adams, Mrs. Marion	46 Mag's Barrow, Ferndown, Dorset
1955	Adams, Mrs. K. L.	1 Gleneagles Avenue, Parkstone
1958	Agar, R., A.M.I.C.E.	84 Howard Road
1958	Aiers, A. J.	Maasdam, Golf Links Road, Ferndown
1958	Aiers, Mrs.	" "
1961	Aiers, Miss E. M.	Flat 2, Earlston, 8 Portarlington Road
1962	Allen, Mrs. A. W. S.	C.43, San Remo Towers, Boscombe
1958	Allen Mrs. F. C.	8 Twynham Road, Southbourne
1963	Allen, Miss May	174 Holdenhurst Road
1960	Alsford, C.	Long Field, Church Road, Ferndown
1960	Alsford, Mrs. J. R.	" "
1956	Ambler, Lieut. Col. M. J.	Min's Cottage, 5a Branksome Wood Road
1955	Ambler, Mrs. A.	" "
1963	Antill, H. Ed.	3 Belgrave Road, Branksome Park, Poole
1963	Antill, Mrs. Mary B. R.	" "
1963	Archer, Mrs. H. M.	4 Barclay Mansions, St. Valerie Road
1957	Arnold, L.	11 Danecourt Road, Parkstone, Poole
1957	Arnold, Mrs. E. L.	" "
1963	Ashburner, Mrs. Y.	Fernmount, New Milton
1952	lAtkinson, Mrs. A., S.R.N.	40 Palmer Road, Oakdale, Poole
1950	Bailey, J. H.	39 Strouden Avenue
1950	Bailey, Mrs. A. A.	"
1962	Bailey, Mrs. E. M.	68 Portchester Road
1955	Bailey, Miss F. E. L.	57 St. Catherine's Road, Southbourne
1955	Bailey, Miss G. L.	" "
1963	Bailey, Miss H. B.	Flat 6, St. Winifred's Court, St. Winifred's Road
1963	Bailey, Mr. Philip Walker	"Upmeads", Glenmoor Road, Ferndown, Dorset
1962	Balfour-Browne, Miss E. F.	Acorn Cottage, Station Road, Verwood, Dorset
1957	Baly, Miss O. M.	70 Brackendale Road
1956	Bamber, Mrs. C. T.	Walhampton Cottage, Lymington
1951	Barker, Mrs. E.	21b Upton Way, Broadstone
1957	Barton-Bullock, Mrs. L.	2 Ravenscourt Road, Southbourne
1956	Bartrop, W. T. C., B.COMM.(LOND.), J.P.	11 Penrith Road, Boscombe
1956	Bartrop, Mrs. M. L.	" "
1944	Bell, T. M., B.A., M.B., B.Ch., M.R.C.S., L.R.C.P.	5a Stourwood Avenue, Southbourne
1941	Bell, Mrs. R. M.	" "
1942	Bennett, Miss D.	Caradon, Canford Cliffs Avenue, Parkstone, Poole
1942	Bennett, Miss M.	" "
1962	Bennett, Rev. J. N.	9 Moor Vale Road, Moordown
1960	Bennett, Mrs. J. K. M.	" "

1963	Bennetts, Miss K. M.	57 Harland Road, Southbourne
1947	Berrill, Miss M. E.	Russell Court Hotel, Bath Road
1942	Bickel, T. H.	10 Ormonde Road, Branksome Park, Poole
1962	Binks, Miss I.	78 Southbourne Road, Southbourne
1946	Blackmore, H. C., L.D.S., R.C.S.	17 Ferry Road, Southbourne
1946	Blackmore, Mrs. E. E.	" "
1960	Boite, E. E. G.	17 Browning Avenue, Boscombe Manor
1950	Bone, Miss M. R. M.	28 Westbourne Park Road
1957	Booth, Mrs. L.	41 Cedar Avenue, Christchurch, Hants
1956	Boulton, Miss E. L.	2a Stour Road, Queen's Park
1962	Bowers, Mrs. M. P.	2 Wootton Court, Wooton Mount
1956	Brain, Miss C. M.	16 Knole Road
1962	Brown, Miss V. C.	3 Wollstonecroft Road, Boscombe
1960	Brunstrom, Mrs. J. B.	6 Bradburne Road
1951	wBull, A. W. M., C.B.	Broom House, Chiltern Road, Hitchin
1964	Burford, Miss P. H., B.A.	36 Stourcliffe Avenue, Southbourne
1930	Bury, Miss G. J.	Flat 4, Berne Court, Grove Road
1946	Busby, Miss A. G.	Flat 4, 77 Haven Road, Canford Cliffs
1952	Butcher, A. J., F.R.I.B.A.	"Hilton", Dudsbury Avenue, Ferndown
1957	Butler, G. W.	Old Park Farm, Lytchett Matravers, Dorset
1960	Butler, Mrs.	" "
1954	Byrt, A. H., C.B.E.	14 St. Winifred's Road
1953	Cadwell, W. H., M.I.C.E.	238 Higher Blandford Road, Broadstone, Dorset
1953	Cadwell, Mrs. D. A.	" "
1963	Caemmerer, Mrs. A. B.	Flat 6, St. Winifred's Court, St. Winifred's Road
1928	lCalkin, J. B., M.A., F.S.A.	Virginia House, Langton Matravers
1961	Campbell, Miss M.	"Chadwell", Friars Road, Friars Cliff, Christchurch
1958	Capstick, F., F.I.A.C.	7 Viking Way, Southbourne
1958	Capstick, Mrs. W.	" "
1955	Caswell, Mrs. K.	67 Chatsworth Road
1943	†vChambers, Ernest, F.L.S.	3 Gainslea Court, Derby Road
1950	Chambers, Mrs. E.	"
1955	Chambers, Miss H. M.	Stratton Audley, 9 Tower Road, Branksome Park, Poole
1963	Chambers, Miss V. M.	Flat 3, "Ingarth", Twynham Road, Southbourne
1959	Charter, A.	Flat 3, 1 Cavendish Place
1959	Charter, Mrs. E. E.	" "
1945	Cheesman, Mrs. A.	The Ken, Walkford Road, Walkford, Christchurch
1945	Child, Miss L. M.	Flat 31a, Southbourne Road, West Southbourne
1912	*Chilver, Miss K. M.	2 Cromer Road
1951	Chomé, E. E. P.	6 Alyth Road
1942	Chomé, Mrs. W.	"
1950	Churches, Mrs. E. W., M.B., Ch.B.	The White House, Colebrook Street, Winchester
1962	Clark, Mrs. F. M.	12 Alum Chine Road
1958	Clarke, Miss A. M., B.A.	South Lodge Flat, Rope Hill, Boldre, Lymington, Hants.
1945	†vClarke, H. E., M.A., B.SC., F.R.I.C.	4 Gardens Court, Parkstone Road, Poole
1945	Clarke, Mrs. M.	" "
1927	*Clay, R. C. C., M.D., F.S.A.	The Manor House, Fovant, Wilts
1963	Clode, Mr. J. C.	Thornfield, Oakley Road, Wimborne, Dorset

1958	Cocke, M. H.	18a Penn Hill Avenue, Parkstone, Dorset
1961	Coe, Mrs. G.	33 Cavendish Road
1946	Cohen, E., F.Z.S., M.B.O.U.	"Hazelhurst", Sway, Hants
1926	*Cooper, H. A.	Greenways, 125 Queen's Park Avenue
1941	LCooper, Mrs. E. M.	" "
1951	LCooper, Miss R. I.	" "
1945	Cooper-Hunt, Major C. L., M.A., R.A.(Retd.), Ch.D.	40 Marine Drive East, Barton-on-Sea
1945	Cooper-Hunt, Mrs. E. G.	" "
1957	Corby, J. W.	C/o B.M./F.F.Q.P., London, W.C.1
1952	Corser, Miss G. M.	3 Aspen House, Elm Grove Place, Salisbury, Wilts.
1956	Cox, Miss M. G. E.	Chantelle, 10 Dulsie Road, Talbot Woods
1948	Cox, W. S. I., F.R.E.S.	248 Castle Lane
1948	Cox, Mrs.	"
1962	Cragg, Miss M. A.	Bourne Hall Hotel, Westbourne
1956	Crawshaw, Mrs. M. C.	2 Spring Slades, 15 Cliff Drive, Canford Cliffs
1962	Critchley, Mrs. M. M.	2a New Street, Ringwood, Hants.
1903	*oCurtis, W. Parkinson, F.R.E.S. F.Z.S.	131 Princess Road
1959	Cuthbertson, Miss E.	179a Richmond Park Road
1959	Cutland, W.	South Riding, Honey Lane, Burley, Hants
1959	Cutland, Mrs. H. M.	" "
1961	Dale, Mrs. L. D.	401 Holdenhurst Road
1960	Dalrymple-Watt, Lady G. V.	1 Berwick Road, Talbot Woods
1959	Danne, Miss E. M. M.	Flat 5, 12a Branksome Wood Road
1963	Davidson, Mrs. G. C.	39 Portchester Road
1963	Davies, Mrs. M. J.	21 Sea Road, Boscombe
1952	Day, Mrs. E. T.	10 Barton Gardens, Dawlish, Devon
1955	Deakin, R. H., M.Sc.	Coppins, Harvey Lane, Canford Magna, Wimborne
1960	Deakin, Mrs. E. M.	" "
1957	Dear, Miss D.	23 Burnham Drive
1930	*de Castro, H.	"Yarlington", Springdale Avenue, Broadstone
1962	Dennis, Miss R. S., S.R.N., S.C.M.	32 Crabton Close Road
1935	Derry, Mrs. H. E.	33 Belle Vue Crescent, Southbourne
1947	Dewdney, H., F.R.C.O., L.R.A.M.	15 Wellington Road
1962	Dickson, A. A.	"Muskerry", 23 Sandy Lane, Upton
1961	Dixon, Sir Arthur, C.B., C.B.E., B.A.	Bourne Hall Hotel, Westbourne
1961	Dixon, Mrs. H. M.	3 Richmond Park Crescent, Boscombe
1949	Dixon, Miss H. C.	Meyrick Grange Hotel, 50 Christchurch Road
1958	Domney, Miss M.	Flat No. 2, 77 Haven Road, Canford Cliffs
1960	Dool, Mrs. N. M.	55 East Howe Lane
1960	ADool, Miss J. P. M.	"
1961	Draper, Mrs. G.	68 St. Alban's Avenue, Queen's Park
1953	Dudley, D. J.	17 Widdicombe Avenue, Parkstone, Poole
1955	Dudley, Mrs. I.	" "
1953	Eaton, Mrs. V. W.	12a Alum Chine Road, Bournemouth West
1956	Edmonds, Miss K. E.	74 Namu Road, Winton
1963	Elliott, Mrs. D.	85 South Road, Boscombe
1963	Elliott, Miss Margaret, B.Sc.	"Charlton", Bradbourne Road
1963	Elliott, Mrs. M. S.	24 Tower Road, Branksome Park, Poole
1946	Ellison, Prof. F. O'B., M.D., F.R.A.S.	Pine Apple Cottage, Burton

1955	Exton, Miss F. M., B.A.	39 Branksome Wood Road
1960	Exton, Miss J. M.	" "
1959	Falvury, P.	Alpine, Warren Road, Bournemouth W.
1919	Farmar, Mrs. K. A.	Whitton Lodge, Stevenson Crescent, Parkstone, Poole
1953	Farwell, Mrs. S. M. A.	Latch Farm, Fairmile, Christchurch
1956	Fergusson, Mrs. C.	137 Overcliff Drive, Southbourne
1957	Fiddes, Mrs. I. A.	Tetherdown, Cull Lane, New Milton, Hants
1963	Field, A. J., M.C., B.Sc., F.I.M.	85 Lower Blandford Road, Broadstone, Dorset
1963	Field, Mrs. E., B.Sc.	" "
1960	Filer, Miss A. N.	34 Harewood Avenue, Boscombe East
1934	Finnis, Mrs. F. M.	27 Julian's Road, Wimborne
1951	†wFisher, J.	The Old Rectory, Ashton, Northampton
1957	Fishlock, H. W., B.Sc.	319 Belle Vue Road, Southbourne
1957	Fishlock, Mrs. F.	" "
1963	Fletcher, Mr. Derek	10 Cricket Close, Mudeford, Christchurch, Hants.
1950	Fletcher, Mrs. V.	Teelings Cottage, South Baddesley, Lymington
1954	Follett, Mrs. V.	Windward, Stevenson Crescent, Parkstone, Poole
1962	Foote, H. N., F.S.M.C., D.Opt.	Park Walk, Shaftesbury, Dorset
1963	Fox, Mrs. V.	17 Shaftesbury Road
1945	Foyle, A. A.	"Therapeia", Wilderton Road, Branksome Park
1963	Freeman, Miss R. C.	19 Alumhurst Road, Westbourne
1960	Gahan, Mrs. M.	215 Holdenhurst Road
1961	Galbraith, T., J.P.	71 Carbery Avenue, Southbourne
1957	Galbraith, Mrs. A.	" "
1956	Gandy, Mrs. L.	11 Cranleigh Gardens, Southbourne
1955	Gardiner, P. C., F.R.I.C., M.I.Chem.E., M.Inst.Gas.E.	61 Ophir Road
1961	Gee, Dr. Ed. R., M.A., Sc.D., D.I.C., F.G.S.	3 Felton Crescent, Highcliffe
1951	Goddard, Miss E. F.	215 Holdenhurst Road
1963	Goldie, Mr. A. C.	Parkbury Cottage, 20 Balcombe Road, Poole
1963	Goldie, Mrs. C. D. M.	" " "
1963	Goldie, Mr. E. C. W.	" " "
1959	Gompel, M. E.	12 Chigwell Road
1937	Gompel, Mrs. M. K.	"
1960	Good, Emeritus Prof. Ronald, M.A., D.Sc.	8 Durlston Road
1960	Good, Mrs. P. G.	" "
1949	Goodhart, Mrs. M. S.	West Thorpe, Lymington
1956	Goodman, Miss J. R.	Kenora, 6 Pine Wood Road, Branksome Park
1942	Gorringe, Miss K. M.	11 Branksome Dene Road, Westbourne
1963	Goulton, Mrs. V. O. A. A.	Flat 2, 39 Branksome Wood Road
1963	Graham, Miss C.	6 Sunnylands Avenue, Southbourne
1956	Graham-Vine, Mrs. F. E.	The Angles, West Cliff Gardens
1960	Grattan, Miss L. T.	Tower Cliff Hotel, West Cliff
1953	Gray, Miss E.	44 Edmondsham House, Terrace Road
1956	Green, Miss G. M., M.A.	17 Clifton Road, Parkstone, Poole
1941	Gwyther, W. T.	12 Foxholes Road, Southbourne
1956	Habershon, Miss E. M.	Leas Court, Cliff Drive, Canford Cliffs
1931	Haines, Mrs. E. M.	Appleslade, Linwood, Ringwood, Hants

1951	Haines, Miss G. M.	" "
1951	Haines, Miss R. M.	" "
1961	Haines, Miss E. S.	"Little Orchard", Godshill, Fordingbridge, Hants
1962	Hall, Miss E., B.Sc. (Hons) Lond.	16 Beresford Road, West Southbourne
1957	Halliday, Mrs. Magda	7 Wellington Road
1953	Hancock, Mrs. C. E.	912 Castle Lane East, Iford
1959	Hannam, B., M.P.S.	16 Hazelwood Avenue, New Milton, Hants.
1955	Hannam, Mrs. W.	" "
1959	Hards, Mrs. D. K.	30 Dean Park Road
1960	Hardy, Miss L. H.	20 The Grove, Redhill Park
1951	Harlock, Miss M. L.	44 Heather View Road, Branksome
1961	Harper, Miss A. C.	"Chadwell", Friars Road, Friars Cliff, Christchurch
1963	Harris, Mrs. H. I.	"Carbery", Ashley Lane, Hordle, Lymington, Hants.
1955	Harris, H. V.	Flat 15, St. Winifred's Court, St. Winifred's Road
1958	Harris, Mrs. W. I.	" "
1958	Hart, Miss C. L., S.R.N., C.M.B.	The Thatched Cottage East, Godwin's Croft, Bransgore, Hants
1961	Harvey, Dr. Mrs. F. E., M.B., Ch.B.	C21, San Remo Towers, Boscombe
1959	Harvey, Miss G. E. J.	50 Alum Chine Road
1932	*Hatton, Mrs.	Dutch House, Cliff Road, Barton-on-Sea
1951	Hawker, Mrs. E.	64 Alumhurst Road
1949	Hayley, Miss V. G.	Sandykeld Hall, Manor Road
1951	Haymann, Miss M. S.	39 Queen's Park South Drive
1956	Hayward, H. A., O.B.E., F.G.S.	18 Seacroft Avenue, Barton-on-Sea
1956	Heath, Mrs. C. J.	2 Richmond Court, Hawkwood Road, Boscombe
1954	Henderson, Miss V.	19 Ashmore Avenue, Hamworthy, Poole, Dorset
1954	Hermon, J. A.	43 Stourcliffe Avenue, Southbourne
1961	Higgs, Miss D. H.	"White Gates", 1036 Ringwood Road, West Howe
1961	Higgs, Mrs. M.	"White Gates", 1036 Ringwood Road, West Howe
1952	Hilton, Mrs. D.	East Dyke, Higher Clovelly, Bideford
1956	Hinton, Miss E. M.	1 Lonsdale Road
1962	Hipperson, Miss M.	69 Headswell Avenue
1962	Hodson, Professor F., Ph.D., F.G.S.	Geology Dept., University of Southampton
1961	Hodgson, Miss N.	45 Howard Road
1960	Holbrook, H. S., B.Sc., M.I.E.E., Fel.A.I.E.E.	Flat No. 5, Stauntonhouse, Exeter Park Road
1963	Holbrook, Mrs. M. E.	" " "
1962	Holmes, Mrs. N. E. F.	7 St. John's Road, Boscombe
1952	Holroyd, G.	4 Beechey Road
1961	Hooton-Smith, E. W.	"Wayneflete", 36 Wellington Road
1961	Hooton-Smith, Mrs. B. E.	" "
1957	Hunt, W. H.	Flat 1, 5 Alton Road, Parkstone
1954	Hunt, Mrs. A. K., B.Sc.	" "
1952	Imlach, Mrs. M. G., B.A.	Crofton, 2 Redcotts, Wimborne, Dorset
1954	Irwin, J. V.	16 Duncliff Road, Southbourne
1954	Irwin, Mrs. B. C.	" "
1959	Jackson, Miss M.	1360 Christchurch Road
1933	James, Mrs. M. G.	70 St. Alban's Avenue

1960	James, W. S.	Oaklea, 115 Tuckton Road, Southbourne
1945	Jenkins, Miss P.	Byculla School, Liss, Hants.
1957	Jenoure, Miss C. A.	Eagle Crest, Belle Vue Road, Parkstone, Poole
1957	Jenoure, Miss D.	,, ,,
1963	Johnson, Miss E. R.	36 Stourcliffe Avenue, Southbourne
1962	Jones, Miss O. E. C., S.R.N., S.C.M.	Hobourne Farm, Highcliffe, Christchurch
1963	Jowett, Mr. B. A.	528 Charminster Road
1956	Keith-Walker, S.	Hawkley, Lower Pennington Lane, Lymington
1928	Kendall, Miss G. J., A.R.C.M.	20 Serpentine Road, Poole
1963	Kenworthy, Mrs. J. S. G.	8 Ripon Road, Winton
1946	King, Miss A.	Mercury House, 14 Florence Road, Boscombe
1962	King, M. P., B.A., A.K.C.	17 Strouden Road, Winton
1944	Kirke, Miss M.	Flat 3, Fairthorne Court, 27a Bodorgan Road
1959	Knight, Miss J.	106 Petersfield Road
1962	Lane, Miss J. P.	34 Glenferness Avenue
1956	Lavender, J. H., B.Sc., A.R.C.S.	Heather Lodge, Bransgore, Christchurch, Hants
1959	Lawes, A. V.	48 Seafield Road, Southbourne
1962	Leake, Mrs. I. B.	21 Langside Avenue, Parkstone
1958	Leeland, Mrs. F.	34 Noel Road, Wallisdown
1948	Leonard, Mrs. N.	1 Neville Court, Derby Road
1957	Le Roy, Miss E. S. H.	Forest Mead, Tyrell's Ride, Burley, Hants
1957	Le Roy, Miss M. C. G.	,, ,,
1958	Le Sueur, Mrs. D. G.	49 Wellington Road
1961	Lewis, Miss D. M.	150 Mudeford Lane, Mudeford
1960	Lightfoot, B., O.B.E., M.C., M.A., F.G.S.	Bingley Farm Lane, Barton-on-Sea
1951	Lloyd, G. B., B.A.	58 Glenferness Avenue
1950	Locke, G. S.	85 Seafield Road, Southbourne
1950	Locke, Mrs. J. B. E., B.A.	,, ,,
1947	Logan, Miss A.	157 Southcote Road
1952	Logie, Mrs. G.	Flat 1, "Pendennis", Derby Road
1963	Lopes, Mrs. K. M.	11 Caledon Road, Lower Parkstone, Poole, Dorset
1939	Lowde, Miss E., B.A.	83 York Road, Broadstone
1951	wLowe, Mrs. D. M.	43 Marryat Road, Wimbledon, London, S.W.19
1963	Lowes, Mrs. Beatrice	5 Cowper Road, Moordown
1934	v†Lowther, Miss D. M., B.Sc.	Lonsdale, 15 Mayfield Avenue, Parkstone, Poole
1963	Lucas, Miss J. M.	5 Alum Chine Road, Westbourne
1951	wLyver, Mrs. D. J.	Grove Lodge, Burgess Hill, Sussex
1956	Maddox, Mrs. L. M.	31 Egerton Road, Queen's Park
1964	Mansfield, G. A.	Milton, Church Road, Ferndown
1964	Mansfield, Mrs. O. K.	,, ,,
1959	Mariette, Miss G. A.	4 Mansfield Avenue, Parkstone
1956	Marks, Miss K. M.	11 Ennerdale Road, Kew Gardens, Richmond, Surrey
1948	Markwick, Miss D.	The Leys, 79 Lansdowne Road
1946	Marshall, Miss D.	76 Palace View, Bromley, Kent
1954	Marshallsay, Miss E. N.	6 Overcliff Mansions, 1 Manor Road
1954	Marshallsay, Miss L. E.	,, ,,
1958	Mate, Mrs. F. M.	8 Clifton Road, Parkstone, Poole
1957	Mathews, Miss G. B.	25 Wingfield Court, Manor Road
1960	Maxted, Mrs. G. E.	2a Wilfred Road, Boscombe

1950	Mayo, H. C.	18a Elgin Road
1950	Mayo, Mrs. S. E.	"
1963	MacKeith, Miss M. R., B.Sc.	13 Addis Square, Southampton
1956	McClay, H.	64 Blake Dene Road, Lilliput, Poole
1956	McClay, Mrs. A. E.	" "
1953	McKeown, Miss K. E.	15 Ravine Road
1962	Mead, Mrs. F.	Conifers, Old Farm Walk, Lymington
1950	Meggett, Lt. Col. E. E., V.D.	14 Southlea Avenue, Southbourne
1950	Meggett, Mrs. K. M., M.B.E.	" "
1962	AMesserschmidt, K.	Serrano 59, Madrid 6, Spain
1963	Michael, Rev. Bro., F.R.G.S., B.A. (Hons.), D.A.S.E.	St. Peter's School, Bournemouth
1956	Middlemast, A. H.	86 Hengistbury Road, Southbourne
1956	Middlemast, Mrs. M.	" "
1963	Middleton, Mr. Chas. Sharp, A.M.S.I.T.A., F.R.A.S., F.R.M.S.	"Fernbank", Christchurch Road, Barton-on-Sea
1963	Middleton, Mrs. G. J., T.P.T.C., S.T.P.C.	" " "
1958	Middleton, Mrs. J. M., B.Sc.	Horn Cottage, N. Bockhampton, Christchurch
1962	Milne-Day, D. L.	"Southfield", Burley, Ringwood, Hants.
1956	Mills, Miss N.	20 Marlborough Road
1959	Mitton, J. C., A.C.A.	3 Gainsborough Road
1963	Mondon, Mr. J. H.	Albert Chambers, Albert Road
1957	Moore, W.	139 Alder Road, Parkstone, Poole
1962	Moore, Mrs. J.	139 Alder Road, Parkstone, Poole
1959	Morgan, Commander S. T., O.B.E., R.N. (Retd.)	Bracken Cottage, Blissford, Fordingbridge, Hants
1959	Morgan, Mrs. V.	" "
1963	Moss, F. W.	39 Hengistbury Road, Southbourne
1963	Moss, Mrs. D. M.	" "
1962	Mott, Miss	2 Warren Avenue, Mudeford, Hants.
1961	Myers, A.	25 Gresham Road
1960	Nelson, A., F.C.A.	65 Alyth Road, Talbot Woods
1962	Nelson-Richardson, Mrs. L. G.	8 Benellen Avenue, Bournemouth
1939	Newsome, Mrs. E. C.	184 Belle Vue Road, Southbourne
1963	Newton, Mrs. K. F.	Rose Hill Hotel, Mac Andrew Road, Canford Cliffs
1943	LNicholls, Miss G.	17 Waltham Road
1963	Novak, Martha	Flat 10, Nat. Provincial Bank Premises, Swanage
1962	Odell, F. H. B.	Cottonwood Hotel, East Cliff
1929	Ogden, Miss E.	1 Rossini Cottage, Hedgemead, Bath
1948	Ogden, F.	30 Grosvenor Court, Vale Road
1948	Ogden, Mrs. G.	" "
1950	Ogle, Miss U.	2 Frankland Crescent, Parkstone
1960	Ollier, G.	Rowans, 202 Harewood Avenue, Queen's Park
1960	Ollier, Mrs. B.	" "
1959	Oppé, E. F.	"Peakey", Worth Matravers, Swanage, Dorset
1948	Osborne, Mrs. B. E.	B6, San Remo Towers, Boscombe
1944	Owen, Mrs. E.	2 Rotherfield Road, Boscombe
1958	Page, W. E., M.A. (Cantab.)	53 Petersfield Road, Boscombe East
1945	Paris, Lt.-Col. A., R.E. (Retd.)	11 Stourwood Road, Southbourne
1956	Paris, Mrs. G.	" "
1960	Parsons, Mrs. W.	50 Alum Chine Road, Westbourne
1963	Payne, Miss H. I.	83 St. Luke's Road
1916	*LPenrose, Miss F.	Little Picket, Hightown, Ringwood
1916	*LV†Penrose, Miss M., B.Sc.	" "

1948	Perceval, Mrs. W.	7 Benellen Avenue
1960	Perry, C. C.	15 Seafield Road
1963	Perry, Wm. F., B.Sc., F.R.G.S.	117 Portland Road
1961	Pesterfield, Miss M.	56 Gresham Road
1950	†Peters, Sir R. A., M.C., M.A., M.D., F.R.S.	3 Newnham Walk, Cambridge
1961	Phillips, P. P., Ph.D., F.R.I.C.	87 Bath Hill Court
1961	Phillips, Mrs. V. A. D.	„
1953	Pickering, V. T.	Francesca, Hightown, Ringwood, Hants
1953	Pickering, Mrs. C. G.	„ „
1959	Pierce, Mrs. E. K.	4 Mansfield Avenue, Parkstone
1960	Piggott, H. E., O.B.E., M.A.	29 Harvey Road, Boscombe
1961	Pinnick, A. W.	Strudes Farrington, Blandford, Dorset
1961	Pinnick, Mrs. O. P. P.	„ „
1959	Piper, P. J., F.R.I.C.S.	8 Leigham Vale Road, Southbourne
1959	Piper, Mrs. M. G.	„ „
1962	Poole, Miss C. E.	24 Namu Road, Winton
1955	Porter, Miss D. A.	Deveron Lodge, 23 Christchurch Road
1957	Powis, Mrs. M. E.	37 Wheaton Road, Pokesdown
1963	Preston, Mr. David Christopher M.A. (Oxon.)	"Greenways", 19a Knyveton Road
1960	Price, Miss A.	Alma Cottage, Ringwood Road, Ferndown, Dorset
1946	Prideaux, Miss C.	Upmoor, Ravine Road, Canford Cliffs
1951	wQuillet, L. A.	"Sevenoaks", Springfield, Chelmsford
1963	Rayner, Mrs. K. B.	The Grove Hotel, Grove Road
1951	Rayson, Mrs. M. C. J.	10 Heather Bank, Tower Road, Hindhead, Surrey
1945	†vRead, W. J., M.Sc., F.R.I.C.	15 Carbery Avenue, Southbourne
1951	Read, Mrs. H. A.	„ „
1957	Reakes, Rev. G. S., B.A.	The Chalet, 21b Prince of Wales Road
1957	Reakes, Mrs. K. A.	„ „
1963	Reakes, Miss V.	8 Overcliff Mansions, Manor Road
1945	Richards, Miss E. E., B.Sc.	Stour Lodge, 21 Julian's Road, Wimborne
1942	Richards, Miss M. C.	„ „
1958	Ridsdale, Mrs. M.	14 Erinbank Mansions, Manor Road
1954	Robertson, Miss V. L.	48 Crag Head, Manor Road
1949	Robertson, Mrs. W. M.	Ladies' Club, 24/6 Poole Road
1923	Roden, Miss E. M.	12 Walpole Road, Boscombe
1947	Rooke, Dr. K. B., M.B., B.Ch., M.B.O.U.	Cranbourne, Wimborne
1960	Rose, J.	120a Gladsone Road, Boscombe
1963	Rossiter, Mrs. D. M.	5 Park Homes, Cole Hill, Wimborne
1959	Rowe, Miss F.	23 Stourcliffe Avenue, Southbourne
1963	Rushton, Miss K. M., M.B., Ch.B., M.Sc.	Wester Ross, 20 Greenways, Highcliffe, Christchurch
1951	wSalisbury, Sir E., D.Sc., F.R.S., F.L.S.	Croindene, Strandway, Felpham, Bognor Regis, Sussex
1954	Saunders, Miss W. A.	11 Portman Crescent, Boscombe
1938	Seare, Mrs. S. F. E.	Almer, Blandford
1951	wSecretan, S. D.	Swaines, Rudgwick, Sussex
1963	Selfe, Mrs. M. D.	The Downs Cottage, Lone Pine Drive, Ferndown
1960	Sephton, Mrs. N., M.B., Ch.B.	Flat 1, 4 Talbot Avenue
1951	Sewell, Mrs. I.	4 Maundeville Crescent, Christchurch, Hants
1941	Sexton, Miss F.	60 Uplands Road
1933	Sheffield, Miss I. E.	6 Lonsdale Road
1950	Shillidy, G. A., C.I.E.	Flat No. 10, 31 St. Peter's Road
1944	lShorthouse, B.	Brookside Cottage, Exeter Lane

1937	Simmons, Mrs. I. M.	73 Spur Hill Avenue, Parkstone, Poole
1963	Simpson, Mrs. Claire	Flat 46, Sunningdale, 28 Braidley Road
1920	Simpson, N. Douglas, M.A., F.L.S., F.R.M.S.	3 Cavendish Road
1961	Sims, G. P. W.	22 Duncliff Road, Southbourne
1961	Sims, Mrs. G. P. W.	" "
1959	Slater, G. A.	The White House, 6 Wyndham Road, Parkstone, Poole
1959	Slater, Mrs. E. M.	" "
1963	Slater, Miss M. A.	6 Wyndham Road, Parkstone, Poole, Dorset
1959	Slieker, Miss H. R. M.	133 Seafield Road, Southbourne
1963	Smith, Miss A. M.	17 Little Forest Road, Talbot Woods
1963	Smith, Mrs. M. C.	" "
1963	Smith, Mr. D. V. Harcourt, M.I.Mech.E., M.I.H.V.E., M.Inst. of Eng. & Shipbldg.	" "
1960	Smith, Miss Mabel, M.B.E., S.R.N.	1a Cecil Avenue, Queen's Park
1962	Smith, Miss M. J.	44 Richmond Park Avenue
1959	Soar, Miss I. M.	11 Grosvenor Road
1940	Somerville, Mrs. S.	Rumah Kechil, Pinewood Road, Ferndown
1962	Sparks, Miss A.	"Altofts", Vicarage Road, Verwood, Dorset
1962	Sparks, Miss M.	" "
1960	Statham, Miss B.	The Lighthouse, Hurn Road, Ringwood, Hants
1962	Stiff, Miss F. A.	55 Stirling Road
1962	Still, D. C., F.S.M.C., D.Opt.	56 Highfield Road, Moordown
1956	Stray, J. F.	Browngates, Barton Lane, Barton-on-Sea, Hants
1957	Stray, Mrs. S. V. M.	" "
1964	Strevens, S. M.	153 Portland Road
1947	Stuart-Harris, Miss M., B.Sc.	Woodways, Merley Lane, Wimborne, Dorset
1946	Stuart-Harris, Miss W., B.Sc.	" "
1960	Sunderland, Mrs. R. B.	18 Spur Hill Avenue, Parkstone
1962	Swann, A.	2 Huntvale Road
1950	Sworder, Miss R.	c/o Barclay's Bank Ltd., 659 Christchurch Road, Boscombe
1960	Sykes, Mrs. H. M.	16 Amberwood Drive, Walkford, Christchurch
1962	Tarrant-Willis, F. E.	52 St. Osmund's Road, Parkstone
1955	Taylor, Mrs. B.	164 Belle Vue Road, Southbourne
1959	Thomas, J. W., B.Sc., L.L.B., M.I.E.E., BAR-AT-LAW	4 Albemarle Court, Manor Road
1963	Tinsley, Mrs. D. M.	6 Edenhurst, Grosvenor Road, Westbourne
1958	Titmas, Miss A. E.	Strathmore Nursing Home, 7 Stourwood Avenue, Southbourne
1956	Trail, Miss L. M.	St. George's House, Whitby Road, Milford-on-Sea
1957	Trotman, H. L.	2 Oban Road
1961	Turnbull, A.	40 Southern Road, West Southbourne
1961	Turnbull, Mrs. A. M.	" "
1949	*Turner, G. A.	Winchester House, Fir Vale Road
1963	Turner, Mr. L.	"Homewood", Chine Walk, Parley Cross, Wimborne
1959	Tyler, E. Freeman	Alston, 43 Brackendale Road
1960	Tyler, Miss L.	" "

1962	Velden, Miss J.	"Little Oaks", Wimborne Road, Stapehill, near Wimborne
1950	Venning, Brig. F. E. W., C.B., C.B.E., D.S.O., M.B.O.U.	Pinewood, Butts Ash, Hythe
1950	Venning, Mrs. E. L.	" "
1950	Venning, Miss E. J. L.	" "
1961	Vincent, Mrs. A. M., B.A. (Tasmania)	Benniston House, 49 Christchurch Road
1961	Waldy, Mrs.	The Paddocks, Dover Road, Branksome Park
1955	Walker, Mrs. L. W.	14 Alyth Road
1961	Wallace, Miss J. B., B.Sc. (Econ.)	10 St. Ives Park, Ringwood, Hants.
1961	Wallis, Miss M. E.	2 Warren Avenue, Mudeford, Christchurch
1961	Walter, Mrs. J. M.	12 Heron Court Road
1952	Warden, Miss F. H., M.C.S.P.	12 Robert Louis Stevenson Avenue, Westbourne
1941	Watson, Miss G. V.	C/o Westminster Bank Ltd., 27 Old Christchurch Road
1941	†LwvWatt, Mrs. W. Boyd, F.Z.S., M.B.O.U.	52 Wimborne Road
1946	Watts, Miss N. E.	33 Cavendish Road
1947	West, Miss G. M.	The Knapp, Studland, Dorset
1961	Weston, Miss A. S.	Flat 2, Earlston, 8 Portarlington Road
1958	Wheeler, C. A. P.	c/o Westminster Bank, 74 Kilburn High Road, London, N.W.6
1958	Whimster, Miss L.	C/o 8 Wallace Road, Broadstone, Dorset
1924	Whitaker, Miss E. M.	22 Somerset Road, Boscombe
1924	Whitaker, S. E., P.A.S.I.	22 Selwood Road, Addiscombe, Croydon
1962	White, Mrs. A. W.	4 Clifton Road, Southbourne
1963	White, Miss D. L. M.	Carnbrae House, 23 Pinewood Road, Branksome Park, Poole, Dorset
1963	White, Miss J.	" "
1960	White, Mrs. E.	9 Canford Crescent, Poole
1960	White, N. C.	" "
1931	AWhite, S. J.	50 Drummond Road, Boscombe
1955	Whittle, W. L., M.I.M.E., M.I.F., F.G.S., F.R.A.S.	31 Elgin Road, Parkstone, Dorset
1955	Whittle, Mrs. L.	" "
1955	Williams, Mrs. G. E.	Pineheath, De Maulley Road, Canford Cliffs
1962	Williams, I. L.	"St. Fagans", Ringwood Road, Verwood, Wimborne, Dorset
1958	Winckworth, Miss E. M. C., M.C.S.P.	18 Drummond Road, Boscombe
1963	Winser, Miss M. M.	Flat 3, Mount Blairy, 23 St. Winifred's Road
1950	v†Winter, W. P. B.Sc.	27 Horsa Road
1951	Winter, Mrs. H.	"
1956	Wise, Mrs. B.	55 Namu Road, Winton
1959	Witherby, H. L.	9 Commercial Road, Parkstone
1960	Withers, A. E.	13 Beechey Road
1960	Withers, Mrs. D. E.	"
1948	AWood, Miss E. B., B.Sc.	4 New Park Road, West Southbourne
1958	Wood, F. J.	17 Montagu Road
1956	Wood, T. E., M.A., LL.B.	21 Durley Chine Road
1957	Woodger, Miss M. J.	70 Brackendale Road
1960	Woods, Miss M.	Alma Cottage, Ringwood Road, Ferndown, Dorset
1953	Wootton, Miss E. M.	22 Elgin Road

1949	†vWray, D. A., M.Sc., Ph.D., F.G.S.	42 Canford Cliffs Road
1949	Wray, Mrs. A.	" "
1956	Wray, Miss J., S.R.N.	" "
1946	Wycherley, Mrs. L.	11 Hayes Avenue
1960	Yeatman, Mrs. M.	Lantern House, Avenue Road, New Milton
1958	Yule, Mrs. M. P.	29 Montagu Road

Bournemouth Natural Science Society

List of Presidents (1903–1964)

1903—04	J. E. Beale (Mayor of Bournemouth).
1904—06	G. E. J. Crallan, M.A., M.B., M.R.C.S.
1906—07	H. J. Waddington, F.L.S.
1907—09	A. Ransome, M.A., M.D., F.R.C.P., F.R.S.
1909—10	Dr. A. Smith Woodward, F.R.S., F.L.S., F.G.S.
1910—11	Dr. Dukinfield H. Scott, M.A., LL.D., F.R.S., F.L.S., F.G.S.
1911—13	Sir E. Ray Lankester, K.C.B., M.A., LL.D., F.R.S., F.L.S.
1913—16	Sir Daniel Morris, K.C.M.G., J.P., M.A., D.Sc., D.C.L., F.L.S.
1916—17	The Rt. Hon. the Earl of Malmesbury, D.L., J.P.
1917—18	Sir Jethro J. H. Teale, M.A., D.Sc., LL.D., F.R.S.
1918—20	Field-Marshall Lord Grenfell of Kilvey, G.C.B., G.C.M.G., LL.D., F.S.A.
1920—21	Lt.-Col. Sir David Prain, C.M.G., C.I.E., F.R.S.
1921—23	F. G. Penrose, M.D., F.R.C.P., F.Z.S., M.B.O.U.
1923—24	Sir F. W. Keeble, K.B.E., D.Sc., F.R.S.
1924—26	Hubert Painter, B.Sc., F.C.S.
1926—28	Heywood Sumner, F.S.A.
1928—29	Claude Lyon
1929—30	Professor F. O. Bower, D.Sc., F.R.S.
1930—31	Henry Bury, M.A., F.L.S., F.G.S.
1931—32	Dr. Dukinfield Scott, M.A., LL.D., F.R.S., F.L.S., F.G.S.
1932—33	J. P. Williams-Freeman, M.D.
1933—34	Rev. F. C. R. Jourdain, M.A., F.Z.S., M.B.O.U.
1934—35	Sir F. W. Dyson, K.B.E., M.A., D.Sc., LL.D., F.R.S., F.R.A.S.
1935—36	Henry Bury, M.A., F.L.S., F.G.S.
1936—37	Sir Harold Carpenter, M.A., D.Sc., F.R.S.
1937—38	Professor John Cameron, M.D., D.Sc., F.R.S.E.
1938—39	Professor G. D. Hale Carpenter, M.B.E., D.M., F.L.S., F.Z.S., F.R.E.S.
1939—40	W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P., F.R.S. (Edin.)
1940—41	Rev. Professor M. C. Potter, M.A., D.Sc., F.L.S.
1941—42	Inst.-Capt. M. A. Ainslie, R.N., M.A., F.R.A.S.
1942—43	William C. Simmons, B.Sc., A.R.C.S., F.G.S.
1943—44	Professor S. Mangham, M.A.
1944—45	A. S. Hemmy, B.A., M.Sc.
1945—46	J. F. N. Green, B.A., F.G.S.
1946—47	Lt.-Col. G. C. Drew, D.S.O., F.S.A.
1947—48	W. J. Woodhouse, A.C.P.
1948—49	Dr. Edward Hindle, M.A., D.Sc., F.R.S., F.Z.S.
1949—50	Mrs. Boyd Watt, F.Z.S., M.B.O.U.
1950—51	Professor Sir R. A. Peters, M.C., M.A., M.D., F.R.S.
1951—52	Ernest Chambers, F.L.S.
1952—53	F. Williamson, F.R.Hist.S.
1953—54	H. E. Clarke, M.A., B.Sc., F.R.I.C.
1954—55	W. J. Read, M.Sc., F.R.I.C.
1955—56	W. S. Brown, B.Sc.
1956—57	A. W. Legat, M.Inst.C.E., M.I.S.E.
1957—58	Dr. D. A. Wray, M.Sc., F.G.S.
1958—59	Miss M. A. M. Penrose, B.Sc.
1959—60	Miss D. M. Lowther, B.Sc.
1960—61	James Fisher, M.A., F.L.S., F.Z.S.
1961—62	W. P. Winter, B.Sc.
1962—63	Dr. F. H. Perring, M.A., Ph.D.
1962—63	Miss F. M. Exton, B.A.

BOURNEMOUTH NATURAL SCIENCE SOCIETY

Summary of the Accounts for the year ending September 30th, 1963

1961/62	Receipts.	£ s. d.	£ s. d.
555 17 6	Subscriptions to 30.9.63 ..	572 17 6	
54 2 9	Covenant Tax Refund ..	54 5 11	
			627 3 5
	Rents, etc.		
150 0 0	Royal Commonwealth Society	225 0 0	
75 0 0	Camera Club	75 0 0	
			300 0 0
8 1 1	Royal Commonwealth Society, gas refund ..	17 11 10	
6 6 11	Telephone call box ..	7 10 9	
1 10 0	Projector fees	3 15 0	
10 0	Sundries	15 15 0	
			44 12 7
3 0 0	Field meetings, refunds ..	8 1 5	
44 6 6	Garden Party	48 17 11	
12 15 8	New Year Party, cash for tickets sold and not re-claimed	4 2 6	
23 19 7	Teas (net)	20 15 6	
			81 17 4
—	Donation		21 0 0
	Total of Ordinary Receipts		1074 13 4

1961-62	Payments	£ s. d.	£ s. d.
125 18 8	Caretaker (Wages and Insurance) ..	128 4 10	
35 3 9	Insurance	46 16 0	
3089 0 10½	Maintenance	380 15 9	
234 7 8	Rates	224 6 6	
			780 3 1
26 9 10	Coal	21 12 8	
136 17 4	Gas	144 4 11	
83 14 1	Electricity	127 3 2	
6 9 6	Water	12 8 3	
			305 9 0
46 16 3	Postages	47 14 7	
126 10 8	Printing and Stationery ..	165 15 3	
73 10 0	Proceedings	98 0 0	
36 12 8	Telephone	37 0 7	
			348 10 5
61 16 0	Garden	90 0 0	
5 15 4	Library	11 17 1	
			101 17 1

357	*15*	*6*	Interest on Investments ..	285	14	6	
189	*18*	*9*	Interest (Income Tax Refund)	167	12	9	
							453 7 3
			Receipts other than Ordinary				
310	*0*	*0*	Transferred from Library Account				300 0 0
—			Sale of £1,000 4% Consolidated Stock ..				674 16 0
—			Sale of £1,000 British Electricity Stock 1974-79				887 6 0
			Balance at Bank 30.9.62 ..	97	19	4	
			Cheque in hand	2	8	6	
			Cash in hand		9	2	
							100 17 0
							3490 19 7

12	*14*	*0*	Subscriptions to other Societies	22	14	0	
42	*18*	*9*	Sundries	51	5	8	
							73 19 8
			Total of Ordinary Expenses				1609 19 3
			Payments other than Ordinary				
			Maintenance (non-recurring)				1476 14 10
			Balance at Bank 30.9.63 (less cheque not presented £2 2 0 ..				403 17 4
			Cash in hand				8 2
							£3490 19 7

I have examined the above Accounts with the Books of the Society, and Vouchers for payments, and certify the same to be correct.

ALBERT V. LAWES, *Auditor.*

15th October, 1963.

F. J. WOOD, *Hon. Treasurer.*

BUILDING FUND — Special Reserve

	£ s. d.		£ s. d.
Balance on Deposit at Bank, 30.9.62	163 3 4	Balance on Deposit at Bank 30.9.63	167 16 5
Interest, 30.9.63	4 13 1		
	£167 16 5		£167 16 5

DEPOSIT ACCOUNT

	£ s. d.		£ s. d.
Balance at Bank, 30.9.62	100 9 7	Balance on Deposit at Bank 30.9.63	124 2 10
Interest 30.9.63	23 13 3		
	£124 2 10		£124 2 10

CINE ACCOUNT

	£ s. d.		£ s. d.
Balance on 30.9.62	88 17 6	Hire of Films	22 5 3
Subscriptions to Cine Film Programmes	31 2 6	Postage and Stationery	7 9
		Total	22 13 0
		Balance on 30th September, 1963 at Bank	97 7 0
	£120 0 0		£120 0 0

LIBRARY ACCOUNT

	£ s. d.		£ s. d.
Balance at Bank and in hand 30.9.62	57 6 3	Librarian's Expenses	26 5 1
From Hon. Treasurer (refund of 1961/62 Librarians Expenses)	11 17 1	Library Maintenance	10 10 1
Sale of Books and Periodicals	374 11 6	Transferred to Society Main Account	300 0 0
Donations	20 0 0	Balance at Bank and in hand 30.9.63	126 19 8
	£463 14 10		£463 14 10

FIELD MEETINGS ACCOUNT

	£	s.	d.		£	s.	d.
Cash in hand 30.9.62	11	1	8½	Expenses Field Meetings	8	16	8½
Surplus from Coaches	23	4	8	Transferred to General Account	8	1	5
				Cash in hand 30/9/63	17	8	3
	£34	6	4½		£34	6	4½

GARDEN ACCOUNT

	£	s.	d.		£	s.	d.
From Hon. Treasurer	90	0	0	Debit Balance 30/9/62	1	7	7
				Gardener	57	0	0
				Watercan	1	1	0
				Postage and Sundries		11	5
				Balance in Hand 30/9/63	30	0	0
	£90	0	0		£90	0	0

INVESTMENTS

	Cost			Approximate Value 30th Sept., 1963		
	£	s.	d.	£	s.	d.
£1000 British Transport Stock	775	4	0	712	10	0
£200 County Borough of Bournemouth Mortgage Bond	200	0	0	200	0	0
£500 County Borough of Bournemouth Mortgage Bond	500	0	0	500	0	0
£1,500 Consolidated Stock	979	0	0	1072	10	0
£2,300 5% Conversion Stock, 1971	2093	8	0	2257	15	0
£1,200 4¼% British Electricity Stock, 1974/79	984	4	0	1096	10	0
£1,600 6% Borough of Barking Mortgage Loan	1600	0	0	1600	0	0
£600 6% Exeter Corporation Mortgage Loan	600	0	0	600	0	0
	£7731	16	0	£8039	5	0

Council's Report for the year ending 30th September, 1963.

Our membership figure on September 30th, including 12 belonging to the Gilbert White Fellowship, was 483—a decrease of 6 over the year.

Council regrets to announce the deaths of the following members during the year: —

Mr. G. E. Caswell, M.B.E., M.C. (1955), Mr. F. Coleman, M.C., M.R.C.S., F.D.S. (1951), Miss E. G. Francis (1957), Mr. S. H. Newsome (1959), Mr. F. W. Robins, F.S.A., F.R.G.S. (1953), Mr. W. J. Woodhouse, A.C.P., M.I.H. (1903).

The death of Mr. Robins in April was a severe loss not only to the Society but in particular, the Archaeology and History Section of which he was Chairman. Mr. Robins was an acknowledged authority in the fields of Archaeology and Folk-lore and the author of several books on his subjects. In the death of Mr. Woodhouse the Society has lost a Founder Member, a Past President and a Trustee. The long and varied services of both these former members are outlined on the obituary pages. (Mr. J. C. Mitton has been appointed a Trustee to fill the vacancy caused by the death of Mr. Woodhouse.)

In September the resignation of Mr. H. de Castro from Council was accepted with regret. He was a member of long standing and with connections dating back to the formation of the Society. Mr. de Castro was for several years the energetic and capable Chairman of the Geography Section. In addition, members were deeply sorry to receive on grounds of ill-health the resignations of Mrs. K. L. Adams, formerly a most active and enthusiastic worker, and of Mrs. J. B. E. Locke who, in co-operation with Mr. Locke, has rendered great service in the classification of Society records. Mrs. I. Sewell relinquished her seat on the Council through pressure of other duties but continues to give experienced help as an assistant Ciné projectionist.

During the year Chairmen of Sections have, as hitherto, combined to produce an excellent programme of events, both indoors and in the field. Lectures—50 in all—and for the most part illustrated, have covered the varied aspects of Natural Science to which the Society's studies are directed. Council thanks sincerely those lecturers, both visitors and members, who have contributed so effectively to the success of the series. The Ciné Subscription programmes fully maintain their interest—a continuing tribute to the organiser's selective skill. Field Meetings and Coach Excursions, carefully planned and well led, have been well attended and all concerned have recognised gratefully the planning and hard preparatory work of the Leaders.

On November 17th, before a large audience, the President, Dr. F. H. Perring, M.A., delivered his inaugural address taking as his subject "The Problem of the Irish Flora".

On the social side Council's thanks once again go out to members of the Tea and Entertainments Committees. Unhappily by reason of the severe January weather it was found impracticable to hold the customary New Year Party but this disappointment was largely off-set by the notable success of the Summer Garden Party when the weather was at its best and the attendance the highest ever.

To introduce National Nature Week and draw public attention to the various special exhibits, an inaugural meeting to which the public were invited was held in the Lecture Hall and addressed by our President, Dr. F. H. Perring, M.A. During the week the Society's rooms were thrown open to visitors and organised parties from local schools were welcomed and conducted over the premises. Chairmen of Sections acted as guides and consultants.

Meetings of the British Association, the Council for British Archaeology, the South-Eastern Union of Scientific Societies and the Hampshire Naturalists' Trust have, wherever possible, been attended by our own representatives.

In last year's report reference was made to certain structural and decorative improvements which had been, and still were being carried out. During the year Council has, within permissible financial limits, pursued this forward policy. The Museum has been renovated and redecorated and the floor of the Lecture Hall sanded and repolished. Once again the Society's thanks are due to the Hon. Architect, Mr. A. J. Butcher, F.R.I.B.A. for his careful and persistent watch over its interests.

The refurnishing and fitting up of the Library has now been completed. Under the Hon. Librarian's energetic direction extensive re-arrangement and indexing of the Library Collection has already taken place but the work is continuing. It is satisfactory to record that the costs of refurnishing were, to a considerable extent, met from the sale of surplus books. In April last Mrs. W. Perceval, who had served regularly and efficiently for 15 years as Assistant Librarian, resigned through ill-health. Together with its good wishes Council places on record its sincere thanks for such long service.

Administrative matters have again given rise to much work. In December last, under Section II of the 1961 Rating and Valuation Act, an application for discretionary relief was made to the local Rating Authorities supported by the full analysis of the Society's cultural and educational activities. Although our hopes in this respect were not realised it is satisfactory to be able to state that under the recent new assessment the net amount payable by the Society is rather less than formerly. Early in the year a small sub-committee was appointed to examine closely the question

of our overall insurances, e.g. buildings, contents, public and domestic liability etc. Consequent on this survey, carried out in conjunction with professional advice, a thorough revision has been effected. The basis has been widened to include certain risks not formerly taken into account, cover has in almost all cases been increased adequately to meet present day costs and values and all such insurances, formerly individual, have been assembled within one Comprehensive Policy.

Council is pleased to state that the new Society Caretaker, Mrs. M. Lever, has settled down satisfactorily and it is believed, happily to her duties. Both her capability and regard for the interests of the Society were evidenced during the severe Winter spell when, largely through her careful watch and discretionary use of the boiler, a general freeze-up of the water system was averted. Council records its appreciation.

The Society has again been privileged to call upon the services of its Hon. Solicitor, Mr. G. A. Turner, whose advice as in former years has so greatly facilitated the solution of its business problems. It is indeed grateful.

In an overall expression of thanks Council includes the Chief Projectionists and their assistants whose work has contributed so materially to the success of the various lectures, the Hon. Auditor, Society Officers, Chairmen of Sections, members of Committees and all others who have so generously given of their time and labour. In this connection it has not perhaps been sufficiently realised that the success or otherwise of the Society's activities depends entirely upon the voluntary work of members. In September, over the Chairman of Council's signature, a detailed appeal for more helpers was circulated with the bi-monthly programmes. Council is glad to say that the initial response has been encouraging and is most grateful to those who have come forward to date.

Obituaries.

Frank Coleman, M.C., M.R.C.S., F.D.S.

Mr. F. Coleman, who died in November, 1962, at the age of 86, had been a member since 1951. His father was Alfred Coleman, F.R.C.S., who first introduced nitrous oxide into dental practise. Following his father he became a distinguished dental surgeon and had been one of the leaders of his profession and had held many important positions in the dental world. He served in the R.A.M.C. in the First World War (acting Lieutenant-Colonel), for which services he was awarded the M.C. He was the author of several standard textbooks on dental surgery.

He travelled widely, often professionally, by sea, and had sailed through Magellan's Strait. His lectures to the Society on his travels and one on the History of Inhalation Anaesthesia were of great interest. He worked hard on behalf of the garden and was a member of the Gardens Committee and also of the Editorial Committee until 1961.

H.A.H.

Frederick W. Robins, F.S.A., F.R.G.S.

It was with deep regret that members learnt of the passing in April 1963 of Mr. F. W. Robins who for the past ten years had been a valued and popular member of our Society. Mr. Robins was born at Aldershot and after working for many years in London, eventually settled in Bournemouth in 1923. An enthusiastic archaeologist, he found full scope for his activities in this district, and took an active part in excavations on Littledown Common and at Hod Hill, near Stourpaine.

In 1960 he became Chairman of the Historical and Archaeology Section, and many will recall with pleasure the excellent lectures he arranged and the many instructive field meetings he so ably conducted.

Mr. Robins had wide interests including an excellent knowledge of architecture and he was also the author of several popular scientific books including volumes on water supply, lamps, bridges and ancient smithies. But perhaps he will best be remembered for his detailed study of the evolution of the lamp. For this purpose he assembled a collection of over a thousand different types; and to obtain these he visited almost every country in Europe and parts of North Africa. This unique collection has now been bequeathed jointly to the British Museum and the Pitt-Rivers Museum at Oxford.

Mr. Robins was also an enthusiastic collector of local worked flints and these, together with other archaeological finds he made, were assigned to help in the formation of a local museum at Ringwood.

D.A.W.

William Jonathan Woodhouse, A.E.P., M.I.H.

By the death of Mr. W. J. Woodhouse in January 1963, the Society lost one of its two original members. During his sixty years of membership his record of work for the B.N.S.S. was probably greater than any member had ever achieved. He was born in 1880 near the Horseshoe Common and at 16 years of age was pupil teacher in the Lansdowne School under his father and he followed him as headmaster. Afterwards he moved to Tuckton. He retired in 1945, after teaching for just under 50 years for the Bournemouth Education Authority. In his younger years he took at least twelve City and Guild Examinations to be able to teach in various subjects. For many years he taught in the Municipal College evening classes. Photography and Engineering Workshop practice were his life's hobbies. During the 1914-18 war he trained many men in Turning to enable them to enter the various shell factories. His collection of lantern slides, mainly of his own making, numbered over 13,000. His output of writings and map drawings in the sections of which he was Chairman was very great as the writer of this article knows from over 30 years close contact. When he retired from school life he travelled all over Dorset and

West Hants for Messrs. Philips & Son, the Geographical Publishers, and only gave up when he entered his eightieth year. His collection of photographs of Old Bournemouth is perhaps the best in the town. His lectures on Old Bournemouth over many years made him widely known to the public. For 64 years he represented the Teachers' Mutual Society in the town. His record of service to the Society is briefly as follows: —

1903—Original Member; 1905—Delivered his first lecture to the Society; 1906-07—Member of Committee; 1916-20—Member of Council; 1920-36—Member of Council and Hon. Assistant Secretary; 1920-23—Chairman of Geology Section; 1936-45—Hon. Secretary; 1936-43—Chairman of Geography Section; 1945-46—Chairman of Physics Section; 1945-55—Hon. Treasurer; 1947-48—President; 1952—Vice-President.

H. de C.

Reports of Sections for the year ending September 30th, 1963.

Library.

All the books have now been returned from store and the work of classifying them and of preparing a card index is in hand. These will be relatively long tasks and the Library Committee wish to record their appreciation of the regular assistance which is being given by several members.

Members generally have approved the new layout of the shelves and the new display rack for periodicals.

Two recently published books were purchased and added to the Library, viz: — "Wildlife in Britain" by Richard Fitter and "History of Domesticated Animals" by F. E. Zeuner.

H. S. Holbrook.

Museum.

Once again owing to the alterations to the rooms, and the decorating and painting, a great deal of work has had to be done by the House Committee (Chairman, G. A. Shillidy) in clearing cases, boxes, etc. from one room to another for which we thank them.

Miss F. M. Exton and her Committee have also performed a difficult task in removing the accumulation of dust on the many glass cupboards and cases. Several glass cases of birds, a cabinet of moths and butterflies, a cabinet of birds' eggs and cardboard collecting boxes were presented to the Milton Abbey School.

The Headmaster has given them a large building and the pupils have made a splendid exhibition of Natural History subjects from our material. They have recorded their thanks to our Society for the gifts and have issued a welcome to visit their Museum when we are in their district.

Wm. L. Whittle.

Garden.

The garden suffered badly from the exceptionally severe winter though many plants recovered and the damage proved to be less than at one time feared. The strip under the west fence was worst hit but, apart from this, our trees and shrubs are developing well. We derive benefit through regular part-time employment of a gardener but our very small party of voluntary workers is badly in need of help either at certain times or to undertake care of some small portion. The chairman will welcome any offers of help. In this connection we regret the loss of Mrs. N. Leonard from the Committee after fourteen years of practical help so willingly given and so much appreciated.

We thank Mrs. Harris, Mrs. Leonard and Mrs. Read and others for gifts of plants. Our garden was much admired at the Society's Garden Party. Members are reminded that there is always something of beauty or interest which any of the Committee will be pleased to point out.

Winsome Chomé.

Archaeology and History.

This Section has suffered a very great loss in the death of its former Chairman Mr. Robins, and several excursions which were envisaged amongst other varied activities of this group have, of a necessity, been cancelled.

It is hoped, however, that interest in this field will still be sustained and that members will come forward with suggestions regarding sites that they might wish to visit during the coming Summer Session and also the type of lectures which would arouse the greatest interest and response in the latter part of the year.

New discoveries are always being made, even on the oldest known sites, and where recent finds are the subject of controversy between eminent archaeologists such as the "Mycenean Influences" of Stonehenge, one is stimulated with the desire to inspect the monument once again and to draw one's own conclusions.

Local Archaeological Societies will be undertaking excavations in the near future, and volunteers are usually welcome if anyone has the time or the urge to take part in a "dig".

Some members might even prefer to go a little further afield, and visit or revisit the caves of Lascaux with their wonderful examples of Stone Age art.

There is now evidence that similar paintings in subject, colour and design have been discovered in great numbers in Africa, from Tanganyika and stretching down the eastern side of the continent to the Cape of Good Hope, then northward up the west side of Africa. These paintings, it is true, were probably made during the past few hundred years, but they are the work of the Bushmen of that day who were definitely Paleolithic men and survivors of the Old Stone Age. A visit to Lascaux where almost identical drawings

were made by their ancestors of thousands of years ago might prove to be a most absorbing and fascinating experience.

Will interested members see the Chairman who would be very pleased to arrange for the desired tours or excursions, and, may I take this opportunity of saying that any suggestions or offers of help are always welcome.

C. Simpson.

Astronomy.

On October 20th, the Chairman lectured on "Venus and the Planetary Probes", describing the modern work on the period of rotation and the atmosphere of this planet. At the time of this lecture the probe Mariner II was still in orbit which was described and discussed. On March 2nd he spoke on "Comets, their Nature, Orbits and Origin", selecting some of the more famous for description. He made brief reference to recent speculation on the possible siderial origin of, and influence on, some long period comets. On June 29th, the Chairman also described some recent publication by Sir Bernard Lovell of work carried on at Jodrell Bank for some years past on "Radio Stars", some of which had been identified by the intense "metre radiation" emitted during their periods of "phase activity" which correspond to solar periods of "sunspot maxima".

On December 29th, Mr. W. L. Whittle spoke on "The Splendour of the Heavens" which he illustrated by a large number of slides exhibiting noteworthy portions of the Milky Way and the spectacular nebulae and star clusters belonging to our galaxy or to nearer groups.

On January 19th, Mr. C. Pithers, an active member of the Jupiter Group of the British Astronomical Association, described current work on the largest planet, in some of which he has participated, including the radio emission and the remarkable variations in the belts and the great spot.

On March 16th, Mr. W. H. Day, F.R.A.S., described the system known as Relativity in a manner suitable for those of small mathematical training.

On April 20th, Miss Maureen Allen of the Southampton Astronomical Society spoke on "Mapping the Moon", briefly sketching the earlier work and describing with slides the remarkable Soviet Lunik III achievements in the photography of the remote side of the moon, which may be said to have turned a new page in the history of Astronomy.

W. P. Winter.

Botany.

This Section has maintained its programme of activities during the past year with a monthly lecture in the period from October to March and field meetings in the spring and summer. The lectures were well attended but the attendance at field meetings inevitably varies with the weather conditions which were unpropitious on

many occasions this year. There were six excursions by coach, including the annual "Autumn Tints" for which the day was fine though dull so the tints could not be seen to their best advantage. An outstanding day was spent in the New Forest at the end of June when our President, Dr. F. H. Perring, joined the party and led by Brigadier F. E. W. Venning, we visited the habitats of most of the outstanding rarities of the New Forest.

The week of May 18th-25th was the first National Nature Week, designed to bring home to the general public as well as to Societies, the importance of conserving our national heritage of wild life in these times of increasing industrialisation. The botany section made a large contribution to this effort, staging an exhibit of plant photographs and arranging a day at Selborne, home of the great Naturalist, Gilbert White, where the Hampshire Trust had organised a full programme of activities. We were very grateful to our President for arranging to visit us on Saturday, May 18th in order to open the proceedings.

We should like to thank the leaders of all excursions and our lecturers for giving their time and energy to enable us to provide such a varied programme and we are particularly indebted to the Bournemouth Parks and Gardens Department for providing two lectures and arranging a visit to the King's Park Nurseries.

This Section of the Society is closely connected with the Hampshire and Isle of Wight Naturalists' Trust through our member, Mrs. M. P. Yule, who is to be congratulated on the most satisfactory results which she has achieved. A report of the year's work is appended.

PLANT NOTES—contributed by members

Helleborus viridis—plentiful this year in the Cranborne area.

Delphinium ? ajacis—seen in a cornfield near Downton (Wilts): definitely not a garden escape.

Erysimum cheiranthoides—on waste ground in Southbourne (now being built on).

Tellima grandiflora—naturalised at Studland.

Drosera anglica—confirmed at Wootton Bridge, New Forest.

Lythrum hyssopifolia—Christchurch area.

Callitriche stagnalis and *Callitriche platycarpa*—Queen's Bower, New Forest.

Gentianella anglica—on Ballard Down, Studland.

Hyoscyamus niger—also on Ballard Down.

Verbascum phlomoides—a casual, but apparently increasing in the Christchurch area.

Utricularia neglecta—Coward's Marsh, Christchurch.

Stratiotes aloides—has become so abundant in Sandown (I.O.W.) reservoir that it is causing trouble. It would be interesting to know whether these plants are male or female.

Scilla autumnalis—very abundant at St. Helen's, I.O.W.
Carex montana—has been rediscovered in the New Forest.
Calamogrostis epigeios—Wootton Enclosure.

Mr. and Mrs. Pickering also report finding three very rare species of fungi:

Clathrus ruber—near Shanklin, I.O.W.
Hydnum erinaceous and *Hydnum coralloides*—in Denny Wood, New Forest.

A. K. Hunt.

Note regarding the Hampshire and Isle of Wight Naturalists' Trust

It the spring of 1963 the county was divided into areas for the purpose of Public Relations and Mrs. Yule was appointed representative for this Western area. She immediately formed a Committee and began the work of increasing interest and membership.

Since the end of April two large Public Meetings have been held, the last of which was honoured by the presence of the Mayors of Bournemouth, Christchurch and Lymington and the Chairmen of the Ringwood and Fordingbridge and the New Forest Rural District Councils. A stand was also taken at the New Forest Show, where the display created a great deal of interest.

There has also been one trip to see the reserves and conditions in the eastern side of the county; and during this winter a series of lectures is being held in the hall of the Red House Museum at Christchurch.

These efforts have resulted in a spread of interest and a large increase in membership. Above all, there is a growing realisation of the great need of nature conservation.

Geography.

During the winter season seven lectures were given on various aspects of geography and the Chairman would like to take this opportunity of thanking the lecturers who contributed to the success of these meetings.

During the period of the Freedom from Hunger Campaign, it was fitting that there should be a lecture on "Food and World Population" which was given by Mr. E. Chambers, F.L.S., who also joined with the Chairman in a talk on the geography of Wales.

Two lectures were on Historical Geography: Miss M. Penrose, B.Sc., illustrated with delightful transparencies, a description of classical sites in Greece, Rhodes and Crete and Mr. D. T. Adams, M.A., showed how changes in climate had led to depopulation of areas of the Sahara.

Mr. J. C. Airey, M.C., M.A., took as his subject "The National Parks of U.S.A., with special reference to the Yosemite Valley" and described the peculiar scenic features of this famous area with the aid of colour slides.

Miss D. M. Lowther, B.Sc., gave an account of some of the West Indian Islands she had visited and Mr. W. L. Whittle, M.I.M.E., M.I.F., lectured on "Yorkshire—the epitome of England".

During May, a 5-day field excursion was organised to Wales, which was entered by way of the interesting border region of Caer Caradoc and the Longmynd. In North Wales the main object was the study of glaciation, the striking features of which are so clearly shown in the Nant Ffrancon Valley.

The ascent of Snowdon was made on a perfect afternoon, so that the whole panorama of mountain and valley was spread out below us.

In Central Wales, the plateau deeply trenched by the Rheidol near Devil's Bridge and the Wye coming from its source on the slopes of Plynlimon, were seen on the way to Brecon with its beautiful little cathedral.

The last day took us down the Wye Valley (where we studied the history of some of the incised meanders) across the Forest of Dean and over the Cotswolds.

On this occasion the Chairman was very pleased to have the help of Mr. Chambers who, with his intimate personal knowledge of the area, contributed so much to the enjoyment of the excursion.

A visit to the Mendips concentrated on the old lead mines at Priddy and Charterhouse, on the swallow hole at East Water, (where the surface water makes its way underground to emerge at Wookey Hole) and on the gorge and caves at Cheddar.

A short excursion to East Dorset provided the interest of a visit to the watercress farm and the beautiful old church at Bere Regis; Culpepper's Dish, where the Tertiary sands have "piped" a joint in the chalk; Cloud's Hill, the former home of Lawrence of Arabia and the chalk ridge from which such a comprehensive view of East Dorset can be obtained.

The last meeting of the season was to Bath, where we were shown, by a Mayor's guide, some of the architectural treasures of the city and where we visited the Assembly Rooms, the Roman Baths and the Abbey.

F. M. Exton.

Geology.

During the past session we have had interesting lectures on four widely differing aspects of our science. In November, Dr. Edward R. Gee, who had been for several years in charge of the Geological Survey of Pakistan, gave us an interesting and instructive account of this little known country and its resources. This was illustrated by a series of colour transparencies he had taken himself during his sojourn in that country.

This was followed in December by an account of the geology of the East Dorset cliffs by Geoffrey G. Poole, now at St. John's College, Cambridge, and formerly resident at Weymouth. An

expert photographer, he showed a remarkably striking series of colour transparencies of this interesting district which were much admired by a large audience.

In January, despite the extreme severity of the wintry conditions, Professor F. Hodson of Southampton University, paid us a very welcome visit and described some unique investigations being carried out under his guidance by some of his students on the thin continuous bands of dirt in coal seams. These revealed evidence of the peculiar conditions prevailing during the period that the coals were being formed, and the talk gave rise to an extended and interesting discussion.

The final lecture of the session in February was given by the Deputy Borough Engineer of Bournemouth, Mr. R. Agar, A.M.I.C.E. and one of our members. Mr. Agar gave a very full account of the erosion now taking place along the cliffs at Bournemouth and the extended investigations he was making on behalf of the Corporation. It revealed many interesting problems and Mr. Agar gave us some indication of the measures being undertaken to check its extension.

In the Spring a popular half-day coach excursion was held to visit the Agglestone Rock on Studland Common and the ancient Stone Circle at Rempstone.

In June a large party toured West Dorset under the guidance of the Chairman and Miss Exton. The remarkable unconformity of the Chalk and Greensand on the underlying rocks was well illustrated at many notable view-points; and on the return journey we travelled through the mile-long Rhododendron Avenue in Yellowham Woods which was then at its best and much admired by us all.

D. A. Wray.

Microscopy.

The 1962/63 lecture session was opened with a lecture by Mr. Whittle dealing with the Microscopy of Coal. Use was made of the micro-projector to show sections of coal and polarised light was used on rocks and coal dust to illustrate structure of the specimens.

In November a most interesting lecture was given by Mrs. Hunt dealing with the wonders of plant architecture as seen under the microscope. Slides and colour transparencies were used as illustrations.

The Chairman used two colour films for the January lecture which dealt with the use of the microscope for photographing opaque substances.

Mr. Chambers' lecture in March dealt with "Botany with a microscope" and he described the large and varied microscopic plant life, illustrating their evolution by means of life histories.

We have an extensive collection of micro-slides dealing with Zoology, Botany, Geology and Entomology available for study by any interested members.

A. J. Aiers.

Photography.

The Autumn Season was opened by Mr. T. H. Bickel's description of a trip "With Cargo to the Near East" (Part I). His colour transparencies fully portrayed the sunlight and clarity of the countries he visited.

This was followed by members' colour slides, under the general title of "Kaleidoscope". Mrs. Ambler, Mrs. Dudley, Mrs. Parsons and Mr. A. E. Withers, F.A.I. each contributed slides with comments, which made a varied and interesting afternoon. It would be appreciated if a few more contributors would volunteer for this subject.

In December we were honoured by a personal visit of Mr. W. H. Binning and his Guide Dog "Sally". The former gave a talk after the showing of the film "Leading Lady".

Other visiting lecturers were Mr. R. Pearce, A.R.P.S., who showed the "Possibilities of Colour" by arrangement with Hanimex of London and Perutz Photowerke of Munich, to whom we are indebted; also Mr. Frank Burridge who gave "A Slide Show with a Difference"; an apt title, as his particular method of presentation with double projection and tape recordings was distinctly novel and proved very popular.

"Pictorial Composition in Colour" by the Chairman, was illustrated by slides depicting failures and successes in creating a satisfying picture.

The last lecture of the session was "Pyrenean Holiday" by Dr. T. M. Bell, B.A., M.B., B.CH., M.R.C.S., L.R.C.P. He showed attractive and interesting slides, many of botanical subjects.

Attendances were naturally fewer during the severe weather of the first few months.

Our thanks are due to Mr. Holroyd for the unceasing work he renders to the Society as Projectionist; also to all lecturers.

Ursula Ogle.

Physics and Chemistry.

Towards the close of the 19th century it was actually suggested by serious physicists that no further radical or fundamental advances were to be expected in theoretical physics, rather, indeed, that new researches would merely fill already acknowledged gaps of secondary importance.

Even the most perfunctory survey of this Section's activities during the 1962/63 Session is sufficient to show how completely false that prediction was. The doldrums in which physics was becalmed were in fact largely due to a doctrinaire separating-off of chemistry and physics into watertight compartments.

With the realisation of the fact that every atom is a complex system, came the essential unification of the two sciences, and each of them began to reach out into biology, astronomy, cosmology and space-research. The ingenious offerings of men like Michelson, Morley, Lorentz and Fitzgerald, were crystallised into fundamental

generalisations by the genius of Einstein, while an appreciation of identity in the nature of matter and energy led to well-nigh miraculous advances in the field of radiation; more and more light was shed on the components, motions and transformations of atoms, and discoveries of fascinating importance were made in biochemistry and physiology, reaching towards the solution of the deep problem of life itself.

With these exciting advances, undreamed-of in 1890, has come a great surge of activity in all kinds of laboratories, and the recruiting of brilliant young workers, by the thousand, to the new fields that are constantly being opened up and extended both in pure science and in technology.

During this Session all these topics have been touched. In October, Mr. A. J. Aiers, Chairman of the Microscopy Section, lectured on the atomic structure now assigned to precious stones. In February Dr. W. H. Tattersall dealt with the relation between the nervous system and those actual bodily illnesses called psychosomatic. In the same month the writer gave attention to the social and national problem created by the large-scale emigration from Great Britain of able scientists we so much need for our own development, while in March and September respectively the principles of Relativity were discussed by Mr. W. H. Day, and Radiation in its most important forms was considered by the writer, who showed how the transport of sub-atomic particles has, among other things, rendered obsolete and unnecessary the once universally held hypothesis of a luminiferous "Ether".

H. E. Clarke.

Zoology.

The past year will indeed live long in the memories of the meteorologists and householders as well as ornithologists, for few can recall the equal of the long continued day and night temperatures below zero, the snow blanket, and the consequent discomforts and frustrations of the opening months of 1963. In its own way the Group Field Diary for January and February registers the effects of these conditions on the only two Meetings it was possible even to attempt.

Similar severe weather in W. Europe naturally gave rise to discussion concerning the probable late arrival of migrants. It appears that there was later crossing at some points along the South Coast, but no serious delay of the main streams. Some factual support for this may be mentioned. In one's own garden Chiffchaff, Willow-Warbler, Blackcap, Spotted Flycatcher and others were passing through at the normal time. Further, the reports from the North of England showed that most migrants were there, so to speak, on schedule. There was in fact definite thaw and rain by the middle of February.

Specially vulnerable species are to be found, ipso facto, among the rarer birds, e.g. Dartford Warblers, Long-tailed Tits and Stonechats in our own area. There is, however, firm evidence that these

have survived, though in much reduced numbers. Yet similar conditions in the coming winter could easily wipe out the Dartfords. (And they used to bathe in one's garden pool!) Waders too, even on the South Coast, suffered severely. Many died because the continuous very low temperatures denied them food, and sometimes froze them where they stood in their natural feeding grounds.

Garden birds and those normally living near to towns and villages naturally fared better; but no reference to the winter would be complete without mention of the widespread efforts of householders to keep alive not only their 'residents', but the strangers never before seen who wandered into their gardens. Starvation caused some to enter houses; others were carried inside to be warmed and fed. Shore birds were even tended in bathrooms. It all represented much effort, born of pity, and gave much satisfaction. So with many of the forest animals among which privation was severe. There was extensive official feeding but many deer were unable to survive.

Scattered among the normal and varied interest on Stanpit Marsh this year were Red-throated Diver, Grey Plover, Whimbrel, Sanderling, White Wagtail and more Grebes and Terns (117 Aug. 12th) than usual. More corpses too! In contrast Redshank, Curlew, Sheld-duck, Herons and Snipe continued noticeably fewer than two or three years ago. One usually sees a fair number of Dunlin, but nothing to compare with the flocks of 1,500 and 2,000 watched in the late nineteen-fifties, all swerving, turning and glistening in the sun in the same second of time. Of many possible reasons for fluctuation none are certain, but regular visits to the Marsh provide no evidence whatever that it is due to casual use by increased numbers of people. So far this is satisfactory and interesting in view of a certain amount of unavoidable press mention since 1960.

Note.—During the winter the Group Field Diary will be available occasionally at Headquarters to any member who may be interested.

H. V. Harris.

Cine Film Subscription Programmes.

The interest of members in these programmes was well maintained during the past winter session. The attendance varied from 68 to 137 and the average was 103. The Season Subscription was paid by 53 members. The films shown are intended primarily as visual aids to knowledge; entertainment value there may be also, but this is often found in nature itself.

The programmes are not linked with any particular Sections but are independently arranged. Every effort is made to show films to illustrate the work of as many Sections as possible. Films relating to Botany, Entomology, Geography, History and Zoology are more readily obtainable, but occasionally a film is found to illustrate one of the other subjects.

The search for films sometimes discloses one which is suitable for illustrating a lecture and it is brought to the notice of the appropriate Chairman. During the past year three such films have been used to illustrate lectures.

Our thanks are due to the Ciné Projection Panel—the Leader, Mr. D. J. Dudley, and his Assistant, Mrs. I. Sewell—for their contribution to the success of the Programmes.

We are also grateful to Mrs. Boyd Watt for kindly supplying the Programmes of Films shown to the British Association for the Advancement of Science at their Annual Meetings.

Suggestions of films suitable for our programmes will be welcomed if accompanied by particulars as to where they can be obtained on hire.

J. H. Bailey.

Club Days.

The attendances at these monthly meetings varied from 20 to 50.

At the October meeting Mr. A. J. Aiers, Chairman of the Microscopy Section, spoke on the Minerals and Polarised Light slides made by the late Mr. Wycherley. At the November meeting Mr. F. W. Robins, F.S.A., F.R.G.S., gave a talk describing a visit he had conducted during the summer to the Lascaux and other prehistoric cave sites in Southern France. In December reports on the Annual Meeting of the British Association for the Advancement of Science held at Manchester were made by Mrs. W. Boyd Watt, F.Z.S., M.B.O.U., Mrs. Hards, Mrs. Fiddes, Miss Whitaker, Mrs. Moore, Rev. G. S. Reakes, B.A. and Mr. Holroyd.

Other subjects illustrated and discussed were: — The Library, Colour Projection, Any Questions, Geographical Excursions (by Miss F. M. Exton, B.A.), the B.N.S.S. Collection of Coins (by Mr. Aiers), "Summer Holiday" (by Mrs. Boyd Watt, Mr. E. Chambers, F.L.S., Mr. Cox, F.R.E.S., Mrs. Bell and Miss Bone. A very popular subject "Colour Slides" was illustrated and described (by means of 90 slides) by Miss F. M. Exton, Miss J. M. Exton, Miss Ogle, Mr. Dudley, Mr. Hayward and a contribution of 20 slides by Mr. A. E. Whittle, Yorkshire.

In March Mr. Dudley exhibited a wonderful series of Colour Slides including many slides of the Otter.

In June Mrs. A. K. Hunt, B.Sc, Chairman of the Botany Section, took members round the garden, where evidence of the good work carried on by Mrs. Chomé was commented on.

The subjects for the Club Days are chosen by the Chairmen of Sections Committee, and they welcome any suggestions and advice from members.

My personal thanks to all those who are assisting in keeping the "Club Days" working successfully.

Wm. L. Whittle.

Presidential Address.

Modern Geography its Scope and Relation to the other Natural Sciences.

by Miss F. M. Exton, B.A.

(*Delivered before the Society on the 26th October,* 1963)

Geography, the study of the world as the home of Man, has had a varied career for more than 2,000 years, since the Greek scholar, Aristotle, first used the name. In the 4th century B.C. he demonstrated the spherical form of the Earth and realised that the known habitable world only occupied a small portion of the globe. At the beginning of the Christian era, Strabo wrote a detailed and scientific description of the lands bordering the Mediterranean and in 240 B.C. Eratosthenes calculated the size of the Earth to within 100 miles of the figure accepted by scientists today.

But after these promising beginnings, the Middle Ages, with the literal interpretation of the Scriptures, saw the death of scientific geography in Christendom, although in the 13th century the voyages of Marco Polo did much to re-create interest in the ideas of the early geographers.

However, it was not until the end of the 15th century that the clouds of the Dark Ages finally lifted and the great Age of Discovery dawned. In 1492 Columbus landed in the West Indies, imagining that he had reached India by sailing westwards and six years later Vasco da Gama rounded the Cape of Good Hope and reached Calicut in S.W. India. Then in quick succession Magellan and Drake circumnavigated the world and other explorers ventured far and wide in their small sailing ships, so that by 1650 the existence of all the continents, except Antarctica, had been proved.

From this time until the beginning of the 20th century explorers were gradually filling in the details of the continents and had reached the Polar regions. The mass of knowledge acquired by these brave and daring men was carefully catalogued and excellent gazeteers were produced, but these tomes of facts had generally very little scientific background.

I expect that most, if not all, of my present audience suffered from this concept of geography in their early years and learnt long lists of the capes of England; the English counties and their county towns; the products of various countries ad nauseam, without any reference to the explanation of these boring facts.

Modern Geography may be said to date from 1902 when Sir Halford Mackinder, of the London School of Economics, published his Britain and the British Seas and three years later when Andrew John Herbertson, Professor of Geography at Oxford University, delivered his famous paper on the Major Natural

Regions of the World to the Royal Geographical Society. These two publications opened up a completely new approach to Geography in which it was realised that a limited number of causes, capable of detailed study, were in the main responsible for the multitude of otherwise unrelated facts.

If I may be permitted here to become personal for a moment, I should like to tell you of the influence of this development of scientific geography on my own life and interests. When I was at school in the Sixth Form studying History and Languages with no particular aptitude, a young geography specialist from the Oxford School of Geography joined the Staff and, owing to my mediocre showing in the usual subjects, it was decided that I should change over to Geography.

From that moment a new vista of interest opened before me and this afternoon I want to take you along some of the highways and byeways which have afforded, and still are affording, me so much pleasure.

The modern geographer makes use of the other natural sciences in so far as they enable him to build up his knowledge of the world as the home of Man.

The geographer is not an astronomer, but observations of heavenly bodies have always played an important part in determining position, navigating uncharted seas and calculating distances.

By observing the Sun, sun dials based on the highest solar altitude at noon could be placed to give accurate local time. For primitive people living in their own small area, this was sufficient and there was no need for comparative times. But modern man, with ever speeding means of transport, must have a Standard Time for his business or other appointments. So all large countries and continents are divided into Standard Time Zones. For instance, there are eight hours difference in time between Eastern U.S.A. and Western Alaska—one hour for every 15° of longitude.

An added complication arises at 180° E. and W. of Greenwhich, which is the same line of longitude half way round the world. Anyone travelling east has gained twelve hours by the time he reaches this meridian, but anyone travelling west has lost twelve hours, because the sun has been rising later and later. Thus at 180° there are 24 hours or a whole day's difference in time and so here the International Date Line has been established, roughly coinciding with the 180th meridian, but zigzagging to avoid passing through island groups. At this point, if one is travelling east, e.g. from New Zealand to Panama, one has the same day twice, but if westwards, a day is omitted. The necessity for this adjustment is of course obvious with intercontinental travel, but you will remember that in Jules Verne's Around the World in Eighty Days, there was no International Date Line and Phineas Fogg arrived back in London, thinking he had lost his bet, but as he had been travelling eastwards all the time, he found he had gained a day and so won his wager.

A geographer is naturally interested in maps of all kinds and although he is not a surveyor or cartographer, the methods of map making need to be understood, so that the limitations and advantages of any particular map can be assessed. In difficult or densely wooded country the surveyor makes a compass traverse, using the simple equipment of a prismatic compass, a chain and ranging rod. This is a rough and ready method, but in the hands of a skilled surveyor a reasonably accurate map can be produced very quickly.

Where a more elaborate and very accurate map is required the method is by triangulation. A base line is measured correct to a fraction of an inch and from its ends bearings are taken by theodolite to conspicuous features and so a network of triangles is built up. These primary triangulations cover very large areas and are then broken down into smaller triangles for the filling in of details by plane table. This method is used by the Ordnance Survey and the trigonometrical points, where the theodolite is set up, are often seen in dominating positions in the countryside such as on the summit of Snowdon. In the Ordnance Survey Annual Report published in October 1963 it was stated that the re-triangulation of Britain started in 1936 and involving a control framework of 11,678 trigometrical stations had been completed.

When maps have been made they have to be drawn to make allowance for the curvature of the Earth's surface and so the problem of map projections arises. This is an insoluble problem for it is impossible to project a curved surface on to a flat piece of paper. It is however possible to keep the area correct or the shape, but not both at the same time and many projections are a compromise neither distorting the shape nor the size too greatly. In dealing with small areas the problem is not extremely difficult, but in world-maps it is very important and it is necessary to bear in mind the use to which the map is to be put before deciding on the projection. Two examples will suffice to show this.

In Mercator's projection the distances from east to west are correct along the Equator, but are the same at the Poles where they should have diminished to a point. This is an orthomorphic projection in which the shapes are right, so that, away from the Equator, as the distances become too large from E.-W., they are proportionately increased from N.-S. The result is that a land mass like Greenland, far from the Equator, is stretched four times each way and so its area is sixteen times too great. This projection should therefore never be used for distributions where correct areas are essential but it has always been popular because of the familiarity of its shapes. True bearings are straight lines and so it is valuable for nautical charts and maps showing winds and ocean currents.

If a world distribution map is to be made a Mollweide equal-area projection is a good one to use, for here the principle is, that, as distances become too great from E.-W. they must be decreased proportionately from N.-S. to keep the areas correct. This leads to distortion of shapes away from the centre of the map, e.g. New Zealand or N. America.

There are many different projections drawn by many different methods and the area to be shown on the maps and the purpose for which it is being drawn will determine the choice. It is a fascinating branch of geography.

Meteorology is a science which has made great advances during recent years and is of great interest to the geographer, as it affects so greatly the day-to-day activities of Man. Weather forecasting is based on observations of barometric pressure, temperature, humidity and wind direction and force taken at a large number of land stations, on ships at sea and on special weather ships. This information is sent to the Meteorological Office where the readings are plotted on maps and the familiar weather charts drawn.

Our changeable weather is associated with cyclones and anti-cyclones, areas of low and high pressure. The British Isles are situated in a region of unstable air conditions due to the meeting of cold arctic and warm tropical air and as they are also on the edge of the great Eurasian land mass, opposing influences have great play and forecasting is often extremely complicated and uncertain.

The Polar Theory of the depressions which bring most of our rain was first propounded by Bjerknes, a Norwegian scientist. He said that when a mass of cold air and a mass of warm air are moving in opposite directions—as frequently happens in our latitudes—the warm air starts to rise and invade the cold air, forming a bulge round which the cold air moves and undercuts. So the front of the cyclone is marked by muggy, cloudy weather with warm air rising and causing condensation, which provides a period of general rain associated with the warm front. At the back of the cyclone, with its component of undercut cold air the cold front arrives—winds veer and strengthen; the air is cool and fresh and there are frequent showers at first but these gradually die out. This succession gives our changeable weather in Summer or Winter and, in addition, during Autumn and Winter we often feel the effect of dying hurricanes which have travelled from the Gulf of Mexico and been carried eastwards by the North Atlantic Drift.

In the Winter, however, we are often influenced by the great cold of the continent where high pressure develops and winds blow out, often so strongly that the depressions are kept at bay. This is what happened from December 1962 to March 1963, giving us a long spell of very cold weather with easterly winds. It is interesting that during that time the coldest region of the Eurasian continent was not, as usual, in E. Siberia round Verkhoyansk, but in European Russia, so that we felt the full effect of the winds from this bitterly cold area.

These conditions would not prevail in Summer for then the continent warms up and tends to become an area of low pressure, allowing the Atlantic depressions to penetrate eastwards. However, at this time of year the Polar Front is further north and so our best hope of prolonged anticyclonic conditions, with a heat

wave, is when the tropical high pressure, situated near the Azores, extends its influence far enough north to affect the British Isles. This is not possible when the Polar Front is further south than usual, as happened during the disappointing Summer of 1963.

Cloud formations generally give an accurate clue to weather conditions. At the approach of a cyclone the warm air rising over the cold air, first of all forms a thin cover of cirro-stratus clouds, through which the sun looks watery and the moon has a halo. As the clouds thicken they become strato-nimbus and rain begins to fall.

The arrival of the cold front is marked by a breaking up of the continuous cloud cover to form cumulo-nimbus with patches of blue sky giving heavy showers and bright periods. Cumulus clouds indicate rising currents of air, where the level of condensation is marked by the straight base of the cloud which then towers up often in fantastic shapes. Sometimes the cumulus cloud is white and occurs on a warm fine day but at other times it is dark and forbidding and heralds an approaching storm. Stratus clouds indicate still conditions when the air is not disturbed by cyclonic or convectional currents, but layers of air at different temperatures cross the sky.

Weather affects man's activities from day to day, but climate determines his whole pattern of life. The type of climate assigned to any region is based on weather observations taken over a number of years, preferably at least thirty. Professor Herbertson in his Major Natural Regions, referred to previously, divided the world into about twelve main climatic regions and noted that in each type, wherever it occurred, the natural vegetation and animal life were similar in their adaptations to climate and therefore the conditions for arable and pastoral farming were the same. Since 1905 various other classifications have been suggested, but they are all basically alike. It is not possible now to deal with all the regions of the world, but six of the most important types have been chosen and diagrams drawn to illustrate the essential characteristics of each.

Within 5° of the Equator along the Guinea Coast, in the lowlands of the Congo and Amazon basins and in Indonesia and Malaysia, the sun is always high in the heavens at noon and so it is very hot throughout the year. The hot air rises and the moisture condenses and causes heavy convectional rain most afternoons, especially when the sun is overhead. There are no marked seasons and the combined heat and moisture lead to luxuriant growth of evergreen forest, in which falling leaves, buds, flowers and fruits can be found at any time. The trees grow to great heights, struggling to the sunlight; lianas climb up the trunks and along the branches making an almost impenetrable tangled mass. The fauna is adapted to these conditions and, of necessity, much of it is arboreal.

Living under these conditions of oppressive heat and moisture in almost perpetual twilight, man is generally poorly developed

physically and mentally. It is easy to get a living by picking the abundant fruits or scratching the soil to raise a crop of manioc and moving on when the choking weeds spring up again. In fact, with no seasonal swing, life is monotonous and so easy that man is not stimulated to make any effort to raise his standards and these areas have been called Regions of Debilitation where no great civilizations have had their birth.

Still within the Tropics, but further from the Equator, the temperatures are still high, but there is a definite dry season and often 80-90% of the rain falls in the Summer. This is the Tropical Monsoon climate found especially well developed in India, Burma, Thailand and S. China. In India during the 'cold' weather, the temperatures are pleasantly warm and the N. E. Monsoon, generally blowing off-shore, brings little rain, so there are clear skies during December, January and February. Then, as the vertical sun moves north, the land begins to heat up quickly. Temperatures rise; there is still no rain but thunder and dust storms are frequent. Vegetation wilts, the ground becomes parched and cracked and it is a trying time for man and beast. Then, at the beginning of June, the monsoon bursts; the wind direction changes to S.W.; torrential rainstorms occur and, owing to the cloud cover, temperatures drop somewhat. These conditions of general rains continue through June, July and August, but, by the end of September the winds are becoming variable; there is less rain and with clearing skies the temperatures rise to give an "Indian Summer". In this part of the tropics the dry season checks vegetation growth; the forests are deciduous and in the drier parts, give place to grass and scrub. Man living under these conditions has to make an effort, during the summer rains, to provide enough food to last him through the dry season. This he does by growing several crops of rice on the wet lowlands and maize and millets in the drier areas.

These have been called Regions of Increment for if man makes a reasonable effort he is able to reap good crops and have some leisure to apply to other activities. Therefore in these lands ancient civilisations grew up with the accumulation of great wealth and learning and the building of beautiful temples and palaces.

Other Regions of Increment with a very different climate are the so-called Mediterranean Lands. These are found all round the Mediterranean Sea, in California, C. Chile, Cape Colony, S.W. and S.E. Australia. This climate is characterised by warm, wet winters, when frequent cyclones, associated with the Westerlies, bring a moderate rainfall and hot, dry Summers when the winds are off-shore Trade Winds and pressure is high.

The natural vegetation is adapted to these conditions, having to take advantage of the winter rains and be protected against Summer drought. On the well-watered west facing slopes there are evergreen forests, but in the drier parts evergreen shrubs such as myrtle and oleander flourish, often giving rise to thickets—the maquis. On the still drier areas, often made of porous limestone,

is the garigue where small aromatic plants such as lavender and sage make a mat-like growth on the rocky surfaces. Herbaceous perennial bulbous plants burst into short-lived glory in early Spring to die down during the Summer drought.

Man here again found suitable conditions for living, if he worked reasonably hard, and he then had some leisure for cultural activities. So the countries round the Mediterranean were the homes of some of the earliest and most advanced civilisations in Crete, Greece and Rome, based on the production of wheat, oil and wine.

The remote areas with a similar climate, California, S. Africa and S. Australia have achieved prosperity, with the development of rapid transport and refrigeration, by concentrating on the growth and export of citrus fruits and grapes which grow so well in this climate.

If the earliest civilisations flourished in the tropical monsoon and the warm temperate Mediterranean Regions of Increment, the cool temperate latitudes have proved more suited for the development of modern civilisations.

In N.W. Europe, N.W. N. America, S. Chile and Tasmania, owing to the prevailing Westerlies blowing in from the Oceans, the Winters are normally not very cold, but often Spring is slow to arrive and the Summers are never very hot. Rainfall is ample and well distributed throughout the year, while the changeable weather provides a mental stimulus.

The natural vegetation consists of temperate forests in which the trees must be protected against winter cold either by having small tough needle-shaped leaves and sloping branches to shed the snow, like the spruce and pine or by shedding their leaves in Autumn like the broad-leaved sycamore and beech.

Over large areas of W. Europe the natural vegetation has practically disappeared to make room for farm land, for in this region the highly industrialised countries are situated. Agriculturally they are Regions of Effort where man has to work hard to obtain a fair return for his labour, but this has led to a display of ingenuity which has produced some of the most prosperous countries of the present day.

Further inland in the northern land masses are the vast lands of North America and the U.S.S.R. Here, away from oceanic influence, the rainfall is less than in the previous type and falls mostly in the Summer, while Winter precipitation is in the form of snow. In the Winter the land mass becomes very cold with average temperatures well below freezing point, but in the Spring warming up is rapid and the Summers are very warm.

These harsh and extreme climatic conditions do not favour forest growth, except of the hardy sub-arctic pine and birch woods south of the northern tundra, so most of these regions consist of grasslands which are snow-covered in Winter and then, as the temperature rises quickly in the Spring, the grass grows and small herbaceous flowering plants appear, only to die down during the

hot Summer. Here are the granaries of the Northern Hemisphere on the Steppes of the Ukraine and Siberia and on the prairies of Canada and U.S.A. In this Region of Effort, during the last forty years, we have witnessed the phenomenal growth of the U.S.S.R. under the stimulus of a harsh climate, apart from any political considerations.

When conditions become so difficult that, however hard man may work, he receives little return for his labours, the land is what may be called a Region of Privation. This occurs where the climate is so cold that farming is impossible as in the Arctic tundra or where the rainfall is insufficient to support anything but the scantiest vegetation. These are the hot deserts of Arabia, the Sahara, the Atacama of N. Chile, the Kalahari of S.W. Africa and the Great Australian Desert. In all of these areas the rainfall is very small, less than 10in. annually, falling as very occasional heavy storms. Under a cloudless sky, the day temperatures often rise to 90 or 100°F., but as soon as the sun sets, radiation is active and the nights become bitterly cold.

Although it is usual to think of the hot deserts as barren wastes, there are actually few areas which are completely devoid of vegetation, but whatever grows must be able to stand the great heat and prolonged periods of drought. To prevent transpiration in most shrubs the leaf surface is reduced to thorns and spines, while the cactus stores water in its stems and roots, often thereby assuming grotesque shapes. When the occasional storm does occur seeds which have lain dormant in the sand, often for years, are brought to life and within a very short time the ground is covered with a profusion of short lived plants which can complete their life cycle rapidly and seed down to await the next rain. Likewise it is after one of these storms that the cacti bloom.

Under such conditions, man is a nomadic herdsman, trading from oasis to oasis and seeking out the scanty pasture for his flocks. Riches in the rocks have, however, from time to time caused people from other parts to make their home temporarily in the deserts, seeking the gold in Australia, the nitrates in Chile, and more recently the oil of the Sahara.

So far geographical control has shown to what extent man is dominated by his environment. Since the beginning of the 20th century however, such big strides have been made in scientific knowledge and technical skill that it seems sometimes that man is freeing himself from nature's control over his activities.

The Netherlands provide an example of this for here man has succeeded in extending his living space over the sea bed around the coast. This small country, lying partly as it does below sea-level, has long consisted of much reclaimed land, owing its very existence to the strong sea walls which keep out the waters of the North Sea. These polders are very productive but they are not extensive enough to support the growing Dutch population, which has of recent years been augmented by many colonists returning from the former Dutch East Indies.

In the north of the country lay the large shallow arm of the sea—the Zuyder Zee—and it is the reclamation of this that has engaged the skill of the Dutch engineers for the last 30 years. In 1927 a sea wall was built joining the Island of Weiringen to North Holland and thereby reclaiming 50,000 acres of new land. This, however, was a small project compared with the construction of the 20-mile long Enclosing Dam from the eastern end of Weiringen to the Friesian Coast. This was finally completed in 1932 and so the Zuyder Zee completely disappeared as a sea inlet.

A fine road runs along this sea wall, as well as paths for cyclists and pedestrians and space has been left for a proposed railway. Halfway along the road is a striking monument with a sculptured group showing the workers who accomplished this great engineering feat and bearing the inscription—"*A nation that lives builds for its future.*" It is most impressive.

At both ends of the Enclosing Dam are sluices for the discharge of surplus water and locks whereby shipping can enter the Isselmeer, the fresh water lake behind.

After the sea is shut out much work has to be done in draining the soft muddy soil, constructing roads, experimenting to find the best crops to grow, building towns and modern well-equipped farmhouses for the new settlers. These pioneer farmers are very carefully chosen for their efficiency and knowledge of modern methods and are granted leases by the Government.

The North East Polder was opened in 1947 and E. Flevoland in 1957. Work is now proceeding on S. Flevoland and Markenwaard.

At the mouth of the Rhine and Maas there are a number of low-lying islands separated from each other by channels and protected from the North Sea by dykes. The Delta Plan aims at building strong defences which will shorten the coastline by 250 miles, for the total length of the new sea walls will only be 15 miles.

The plan had been projected for some years and in 1948 work was started on closing the Haringvliet and this was completed in 1950, but it was not until February 1st, 1953 that the urgent need for finishing this work was made evident by the disastrous storm which breached the sea walls in 60 places, flooded vast areas of the country and caused great loss of life and property.

Although the reclamation of land is not, in the first place, the objective and ultimate aim of the sealings-off in the Delta Plan, various areas of land situated behind the new dykes will offer an attractive opportunity for drainage and cultivation, but the acreage involved will not be more than 35,000.

It is expected that these schemes will be completed by 1980, but, in the distant future, there remains on the programme, the so-called Wadden Plan, whereby the land between the Friesian Islands and the mainland may be reclaimed and it is not until this scheme too is brought to fruition that the Dutch will consider the Netherlands are definitely completed. Thus we have seen an energetic people making the sea bed into fertile fields by building

great sea walls and drainage canals and so enlarging the productive area of their country.

In the hot deserts, however, it is lack of water which is the problem. There the aridity is so great and evaporation so intense that these regions have always been regarded as ones of lasting difficulty, unless they are crossed by great perennial rivers. Then, like Egypt on the banks of the Nile and Mesopotamia between the Tigris and Euphrates, they have become the seats of great civilisations. They used the waters of their rivers to flood and fertilise the earthen basins, constructed along their banks and great crops of cereals and vegetables were produced after the floods subsided.

Since the beginning of this century, man has acquired the technical skill to build great dams to hold back rivers to fill reservoirs, which provide water all the year round to the fields. So some of the older schemes have been modernised and new irrigation settlements have grown up in places like Lower California, which depends on the waters of the Colorado River, which are held up behind the Boulder Dam.

But this method of irrigation has its disadvantages, for, in the canals under the scorching sun, as much as 40% of water is lost by evaporation, which on the soil causes saline deposits to form. The life-giving alluvium which used to pass with the floodwater to renew the soil in the basins annually, is now being deposited in the reservoirs and choking them up, while the fields need artificial fertilisers. The creation of reservoirs nearby always means the drowning of valuable agricultural land and settlements and even of priceless monuments. The raising of the Aswan Dam would have meant the loss to posterity of the wonderful Abu Simbel temples of Rameses II under the waters of the Nile, unless U.N.E.S.C.O. had decided to spend £13 million to remove them and a further £5 million to rehouse the people whose homes will be submerged.

So modern irrigation often only solves some problems to create others. But the new state of Israel, with no great river, seems to have found a better way of watering her arid regions. In the north of this small country there is quite a good rainfall mostly falling in the Winter, but this decreases southwards, until at Eilat, on the Gulf of Akaba, it is only 2ins. annually. Much of this southern region, the Negev, however, is fertile, the old hard rock being covered with rich loess deposits. Therefore water from the little river Yarkon in Judaea is now carried through two 10ft. concrete pipes to the desert metropolis of Beersheba and then by smaller pipes to the farms and finally sprinkled on the fields.

This scheme, partly completed in 1955, pales into insignificance besides that started in 1960, to pump up the waters of the Jordan, initially from the natural storage of the Sea of Galilee and to feed the waters through 150 miles of great concrete tunnels to the Negev. The advantages are tremendous—there are no evaporation losses and the water supply can be controlled right on to the fields and boosted by pumping when necessary.

Admittedly, the country is small, only 8,000 square miles and distances are relatively short, but surely Israel has indicated the pattern for future irrigation and it has been suggested that a much better plan for Egypt than raising the Aswan Dam would be to pipe the water from the natural reservoir of Lake Tana in Ethiopia, at a height of 6,000ft. to Aswan. The distance is 1,000 miles, but with the great difference in height there would be considerable possibilities of power development. Such a long pipe-line does not seem unreasonable to Professor Martin Jones who, speaking at a British Association meeting at Aberdeen on August 30th, 1963, said he foresaw 1,000-mile pipelines carrying water to arid tropical deserts Heavy crops, twice a year, would be possible with minimum risk of bad weather at crucial periods of sowing and harvesting. Irrigation of the deserts would add up to limitless opportunities for increased world food production.

The two examples of the Netherlands and Israel will suffice to show that the ingenuity of man is freeing him, to a great extent, from the geographical control which bound primitive peoples, but they also show that there are often unforeseen difficulties to be overcome in the struggle with the forces of Nature.

One of the most fascinating branches of geography is geomorphology, the study of land forms and scenery. To understand this the geographer must have some knowledge of geology, but he is not concerned so much with the age of the rocks and the fossils they contain, as with their resistance to the different forces of weathering, which produce such diverse landscapes.

In England and other countries where there is a good rainfall running water is mainly responsible for the sculpturing of the land. Everywhere the hills rise smoothly from the plains, showing the curve of water erosion. However, differences of rock formation give rise to scenery characteristic of each.

In areas of chalk which is porous, there are rounded hills with many dry valleys. On Cranborne Chase above Tollard Royal the slopes are mostly covered with calcareous grassland but there are cultivated fields and woods, generally of ash, especially in the valleys where water is nearer the surface and on the patches of clay with flints which occur in many places.

The more resistant, but still porous, mountain limestone of Carboniferous age, produces a higher plateau as on the Mendips. At East Water, near Priddy, there is a long hollow marking a fissure where the surface water is making its way underground down a swallow hole. By subterranean channels and caves, containing stalactites and stalagmites, this water finally emerges at Wookey Hole to form a head stream of the River Axe. A short distance away is the spectacular steep-sided Cheddar Gorge where the roof of an underground channel has probably collapsed.

On the areas of gravel and soft sandstone, the scenery is rather undistinguished. On Moreton Heath there are hummocks crowned with clumps of pine and silver birch interspersed with patches of coarse grass, heather and gorse.

In the North and West of Britain, where the rocks are generally older and harder, the topography is more rugged and mountainous. In Shropshire the ancient pre-Cambrian grits give attractive scenery in the Cardingmill valley of the Longmynd, while in the Aberglaslyn Pass of N. Wales the swift river is eroding a gorge in the old Silurian slate surface. Still further north the Ben Nevis massif of ancient igneous rock emerges from the clouds, rising to over 4,000ft. above the Glen More lowland.

In these northern regions, during the Quaternary Ice Age valley glaciers left their mark upon the land. The V-shaped river valleys have been overdeepened to form spurless U-shaped valleys like Nant Ffrancon down which the River Ogwen meanders to the Menai Strait. The drainage from the mountain summits is collected in small round tarns in rock basins or corries like Llyn dur Arddu on the north face of Snowdon. Between these corries sharp frost fretted edges or arêtes are left. The streams from these high tarns reach the main valleys by waterfalls which are frequently used for the generation of hydro-electricity as in the case of the Glaslyn stream from Snowdon.

The main valleys are generally occupied by long narrow lakes like Llyn Gwynant. These lakes are formed behind morainic dams seen where the River Rothay flows out of Grasmere. Sometimes the sea has invaded these glaciated valleys to form sea lochs, like Loch Leven in W. Scotland, which are reminiscent of the grander Norwegian fiords.

In wet regions the topographical outlines are smooth but in hot deserts, where there is only an occasional storm to gully the hillsides with stone-filled wadis, the profiles are always harsh and show no curve of water erosion. The hills rise abruptly from the plains and are often nearly buried in their own waste. The fierce sun's heat by day and the cold by night lead to expansion and contraction which, in the case of a homogeneous rock like granite, causes the top layer to exfoliate and the waste to accumulate round the base.

The wind carrying along small stones and sand, attacks the rock surfaces and in sandstone containing harder bands, grotesque shapes are frequently found. The rocks are always undercut at their bases where the wind is carrying larger particles and hurling them at the exposed surfaces.

Sand dunes are also characteristic of the deserts. The material split off from the rocks by temperature changes is swept along and where there is an obstruction the sand is piled up in a crescent shape with the gentler slope on the windward side.

Along coasts with the sea acting on areas of alternating outcrops of hard and soft rock, there is a succession of headlands and bays. This is seen in the chalk of Old Harry; the soft Wealden beds of Swanage Bay; the Purbeck marble of Peveril Point and the less resistant Purbeck sands of Durlston Bay.

Soft sandstone cliffs do not resist wave action for long and are constantly being undermined and falling unless artificially buttressed by man. The material worn away is often carried along by tidal drifts and forms sand spits. One of the best examples of this is along the Suffolk coast, where the tidal current from the north has swept gravel southwards to block the mouths of the Alde and Butley, so that Orford, which was a port on the open sea in mediaeval times, can now only be approached from the North Sea round the South Spit.

A belt of hard rock parallel to the coast can produce an interesting coastline like that at Man o' War Cove. Here the resistant Purbeck and Portland beds provided a protection, but they have now been practically worn away and the sea has quickly eroded the softer Wealden strata, forming a cove and is now attacking the base of the chalk.

And so it is seen that the geological structure of any area is basically important in fashioning the different landscapes whether the agent of weathering be rain, ice, wind or sea.

Time has not permitted mention of all the branches of the subject, but probably enough has been said to show that Modern Geography covers a very wide range and has progressed far from the days when a gazeteer and pictures of places were all that was meant by geography. Now the cause of everything must be sought to build up the true conception of the world as the home of man.

And in exploring these avenues of study the geographer must needs trespass on the fields of the other scientists, geology, botany, zoology, astronomy, mathematics, physics and archaeology from which he gains the essential information to build up a picture of man's environment, to assess the possibilities of future progress and to understand some of the world's most pressing problems.

This address was illustrated by 15 maps and diagrams on slides and 24 colour transparencies.